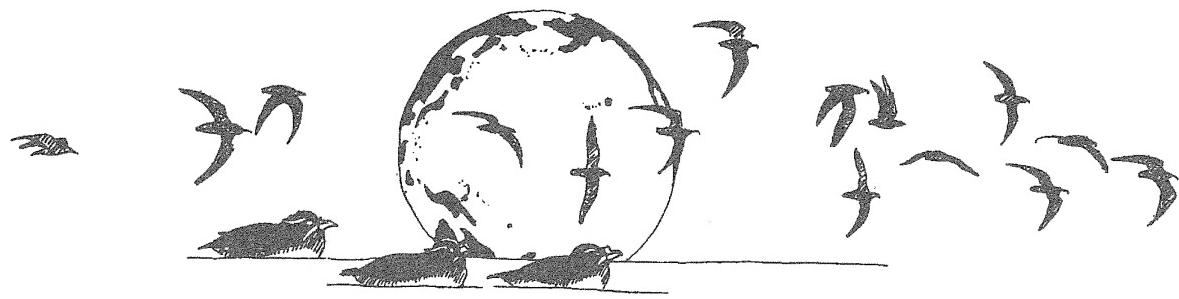


PACIFIC SEABIRDS



A Publication of the Pacific Seabird Group

Volume 31 Number 2

Fall 2004

PACIFIC SEABIRD GROUP

Dedicated to the Study and Conservation of Pacific Seabirds
and Their Environment

The Pacific Seabird Group (PSG) was formed in 1972 due to the need for better communication among Pacific seabird researchers. PSG provides a forum for the research activities of its members, promotes the conservation of seabirds, and informs members and the public of issues relating to Pacific Ocean seabirds and their environment. PSG holds annual meetings at which scientific papers and symposia are presented. The group's publications include *Pacific Seabirds* (formerly the PSG Bulletin), *Marine Ornithology* (published jointly with the African Seabird Group and the Australasian Seabird Group), symposium volumes, and technical reports. Conservation concerns include seabird/fisheries interactions, monitoring of seabird populations, seabird restoration following oil spills, establishment of seabird sanctuaries, and endangered species. Policy statements are issued on conservation issues of critical importance. PSG members include scientists, conservation professionals, and members of the public from both sides of the Pacific Ocean. It is hoped that seabird enthusiasts in other parts of the world also will join and participate in PSG. PSG is a member of the International Union for Conservation of Nature (IUCN), the Ornithological Council, and the American Bird Conservancy. Annual dues for membership are \$25 (individual and family); \$15 (student, undergraduate and graduate); and \$750 (Life Membership, payable in five \$150 installments). Dues are payable to the Treasurer; see Membership/Order Form next to inside back cover for details and application.

World Wide Web Site

<http://www.pacificseabirdgroup.org>

Donations

The Pacific Seabird Group is a nonprofit organization incorporated under the laws of the State of California. Contributions to the Pacific Seabird Group are tax deductible [IRS Section 501(c)(3)] to the fullest extent allowed by law.

Pacific Seabirds

Pacific Seabirds (ISSN 1089-6317) is published twice a year in the spring and fall. It informs PSG members about regional seabird research and conservation news. *Pacific Seabirds* seeks submissions of short peer-reviewed articles, reports, and other items that relate to the conservation of seabirds in the Pacific Ocean. Abstracts of papers presented at the annual meeting are included in the Spring issue; the Fall issue contains a summary of ongoing research. All materials should be submitted to the Editor, except that conservation-related material should be submitted to the Associate Editor for Conservation. Information for contributors to *Pacific Seabirds* is published in each Fall issue. Deadlines are March 15 for the Spring issue and September 15 for the Fall issue. Back issues of the Bulletin or *Pacific Seabirds* may be ordered from the treasurer; please remit \$2.50 each for volumes 1-8 (1974-1981) and \$5.00 each for volume 9 and later (see Membership/Order Form next to inside back cover for details).

Editor

Vivian M. Mendenhall, 4600 Rabbit Creek Rd., Anchorage, AK 99516 USA. Telephone (907) 345-7124; Fax (907) 345 0686; e-mail: fasgadair@att.net.

Associate Editor for Conservation

Craig S. Harrison, 4953 Sonoma Mountain Road, Santa Rosa, CA 95404, USA. Telephone: (202) 778-2240, Fax: (202) 778 2201, e-mail: charrison@erols.com

Pacific Seabirds Submission Deadlines

All items intended for publication in *Pacific Seabirds* must be received by The Editor or Associate Editor for Conservation prior to March 15 (Spring issue) and September 15 (Fall issue). Manuscripts may be submitted at any time.

PACIFIC SEABIRDS

A Publication of the Pacific Seabird Group



Dedicated to the Study and Conservation of Pacific Seabirds and Their Environment

VOLUME 31, NUMBER 2 • FALL 2004

EDITORIAL 42

REPORTS

Potential Effects of a Liquefied Natural Gas Offshore Terminal on Seabirds at the Coronado Islands, Baja California, Mexico – by Bradford Keitt and Alfonso Aguirre	43
Impacts of Mice and Owls on Seabirds of Southeast Farallon Island – by Joelle Buffa and Jesse Irwin	46
Caspian Tern Nesting Ecology and Diet in San Francisco Bay by Dan Roby, Ken Collins, Kim Nelson, Keith Larson, and Jessica Adkins	47
Colony Size, Nesting Success and Predation on Salmon Smolts by Caspian Terns and Double-Crested Cormorants in the Lower Columbia River by Dan Roby, Ken Collins, Jessica Atkins, Kim Nelson, Don Lyons, Anne Marie Meyers, Karen Fischer, Chris Couch, and Garrett Dorsey	48
Caspian Tern Nesting Ecology and Diet at the Dungeness National Wildlife Refuge, Washington – by Dan Roby, Ken Collins, Kim Nelson, Kirsten Bixler, and Jessica Atkins	49
Conservation Report	50

REGIONAL REPORTS

Alaska	58
Canada	64
Washington and Oregon	66
Northern California	69
Baja California	72
Non-Pacific United States	72
Hawaii and Pacific Rim	74
Arctic and Antarctic	74
Student Report	75

TREASURER'S REPORT 76

INFORMATION ON THE PACIFIC SEABIRD GROUP

Published Proceedings of PSG Symposia	78
PSG Committees and Coordinators	79
PSG Life Members and Award Recipients	80
PSG Membership Application and Order Form	81
PSG Executive Council 2004	Inside Back Cover

EDITORIAL

On 26 December 2004, a tsunami in the Indian Ocean wrought devastation that none of us can really grasp. It took lives and caused great suffering from southeast Asia to east Africa. Millions of people's existence was changed forever that morning. Among them are certain to be friends and colleagues of PSG members, and in sister organizations such as the Australiasian Seabird Group, the Seychelles Seabird Group, and the Indian Ocean Seabird Group.

One of us (MCC) was present in Tunisia last November when the Indian Ocean Seabird Group was created. The plans and enthusiasm of the new group reminded me of PSG's *élan* in 1972 (see the report on this new group in "Seabird News"). Since the disaster I have been trying to contact people in that area, but many do not answer. I realize that it is still too early to expect replies, but I fear very much that some of my friends are dead.

At this time our thoughts are with those who lost their loved ones, friends, belongings, and livelihoods. We wish to extend our deep personal condolences and those of the Pacific Seabird Group to our colleagues and others who have been affected by this tragedy. Malcolm has drafted a letter from PSG to Matthieu Le Corre, head of the Indian Ocean Seabird Group, offering our sympathy and support. Letters to other organizations will follow. PSG members will be able to contribute money at the meeting next week. The Executive Council will discuss how best to offer our support to colleagues as they work to put their lives together.

Later, the time will come to learn what effect the tsunami had on seabird habitats throughout the Indian Ocean. There seems to be no information on the impact of past tsunamis on seabird populations. Most birds capable of flight probably escaped the wave. However, individual beaches and islands may have been greatly altered, and many research sites may have been changed or lost. Terrestrial animals such as the tortoises on Aldabra Atoll may have been worst hit, and there is concern for the endemic ibis on the same island. Information that is trickling onto the Web only indicates how variable the wave's impact has been. We know that many coastal areas were devastated; others were spared because mangrove thickets shielded them from the wave (e.g., parts of Tamil Nadu, India), or because local sea-floor topography prevented a wave from building (the island of Diego Garcia). But the Indian Zoological Survey is already planning to assess damage to coral communities in the Andaman and Nicobar Islands.

We in North America were lucky—this time. Let us offer our sympathy and what help we can, never forgetting that sometime we may be the ones who need it.

Vivian Mendenhall and Malcolm Coulter
9 January 2005

REPORTS

Pacific Seabirds publishes Reports to provide information on conservation issues and ongoing research. Reports contain preliminary results and have not been peer-reviewed. Therefore they should not be cited without permission of the authors.

POTENTIAL EFFECTS OF A LIQUEFIED NATURAL GAS OFFSHORE TERMINAL ON SEABIRDS AT THE CORONADO ISLANDS, BAJA CALIFORNIA, MEXICO

Bradford Keitt and Alfonso Aguirre

Islands are important for the conservation of biodiversity. They support high numbers of endemic species, and they provide critical habitat for seabirds and pinnipeds, species that forage over large areas of the ocean but return to islands to breed and rest. Because many island species have evolved in isolation, they are not adapted to human activity. The islands off the coast of Baja California provide critical habitat for a large number of seabirds and pinnipeds. Unfortunately, these islands are coming under increasing pressure from development as the human population on the adjacent peninsula grows rapidly.

Las Islas de los Santos Coronados, now more commonly known simply as the Islas Los Coronado or the Coronado Islands, are an archipelago of four small islands located about 8 miles off the coast of Tijuana, Baja California, México, and only 11 miles southwest of the US–Mexico border at San Diego, California (Figures 1 and 2). These islands support one of the most diverse seabird colonies of California and Baja California, as well as important habitat for California sea lions (*Zalophus californianus*) and harbor seals (*Phoca vitulina*) (Everett and Anderson 1991). Current populations of most seabird species on the Coronado Islands are considerably reduced from historical numbers due to habitat degradation from non-native mammals, human disturbance, and impacts from DDT (McChesney and Tershy 1998, Wolf 2002, Palacios et al. 2003). However, the populations on these islands are recovering due to decreases in DDT and recent direct conservation actions.

ChevronTexaco de México recently proposed to build a very large liquefied natural gas (LNG) re-gasification terminal (henceforth, LNG terminal) only 600 m offshore of Coronado Sur Island. The capacity of the terminal represents at least 16% of the total current Mexican LNG production. The total investment would be \$US 650 million dollars. Such a terminal would negatively impact these seabirds and reduce the capacity for these species to regain their former numbers on the islands.

The proposed LNG terminal would consist of a platform approximately 300 m long that would serve as a receiving dock and re-gasification facility. The dock would accommodate supply ships and house the LNG storage tanks; the re-gasification facility would send natural gas via an underwater pipeline to the mainland. From there the gas would go to the United States market, and eventually to the regional Mexican market. The terminal would have the capacity to receive up to four large tankers (80,000 to 160,000 m³ capacity each) per week; it would be serviced by up to 115 permanent employees living

on the platform. A major justification provided for building the platform in proximity to Coronado Islands is the breakwater effect of Coronado Sur Island.

The LNG terminal will impact the island's species on several levels: direct disturbance, both from construction and general operation of the terminal and from supertankers supplying the terminal; light pollution from the terminal and supertankers; increased opportunity for spills and discharge of petroleum products; increased potential for rat introduction to the islands (rats can easily swim the 600m from the terminal to the island); and the intake, disinfection, and discharge of 188,000,000 gallons of the chlorinated seawater per day.

The Coronado Islands support ten species of breeding seabirds, many of which have protected status in the United States and Mexico (Table 1). The surface nesting species such as Brown Pelican (*Pelecanus occidentalis*) and Double-crested, Brandt's, and Pelagic Cormorants (*Phalacrocorax auritus*, *P. penicillatus*, and *P. pelagicus*) are

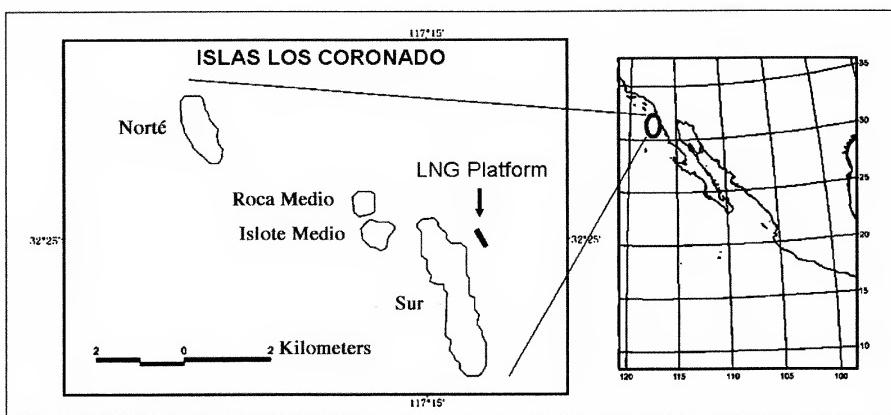


FIGURE 1. Map of the Coronado Islands.

REPORTS – Coronado Islands

extremely susceptible to disturbance. Studies have shown that even one event that flushes birds off their nests can lead to a loss of 80% or more of the eggs to predation by gulls (*Larus spp.*) (Anderson and Keith 1980). Historical observations on nearby Todos Santos Island found over 1,900 broken pelican eggs as a result of human disturbance and subsequent gull predation (Anderson 1988, Willett 1913). Pelicans and cormorants will be negatively affected by construction activities as well as general operational activities of the LNG terminal including noise, helicopter operations, and light pollution from the terminal and the supply ships.

The Coronado Islands also support globally significant populations of nocturnal seabirds, including auks and storm-petrels. Such birds are active on their breeding colonies only at night, mainly as an adaptation to avoid diurnal predators such as gulls and falcons (*Falco spp.*). Nocturnal seabirds are extremely sensitive to light pollution. Lights affect them in two main ways: (1) seabirds are attracted to the lights, thereby disrupting their normal activities and causing mortality as birds fly into lights or structures around them, and (2) light can increase susceptibility to predation by illuminating areas at sea and on the colony. Populations of the Xantus's Murrelet (*Synthliboramphus hypoleucus*), which was just listed as threatened by the state of California, are at the greatest risk from the lights associated with the proposed LNG terminal. This species is especially susceptible even to low levels of light pollution because the birds socialize in nearshore waters while attending colonies from January to July. The world's largest colony of the northern subspecies of Xantus's Murrelets (*S. h. scrippsi*) nests on the Coronado Islands (Whitworth et al. 2003). These islands also host the southernmost colony of the rare Ashy Storm-Petrel (*Oceanodroma homochroa*) and a significant colony of Black Storm-Petrels (*Oceanodroma Melania*) (Carter et al. 1996, Everett 1991).

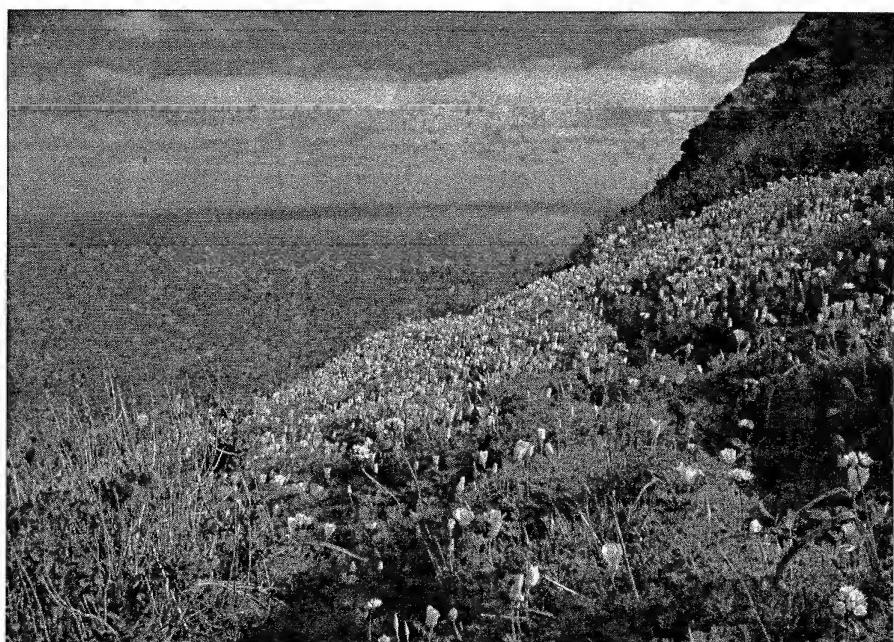


Figure 2. California poppies on the Coronado Islands. By Bradford Keitt.

Because of the importance of the Coronado Islands as seabird and marine mammal habitat, it is critical that these islands remain undisturbed. Unfortunately, the ChevronTexaco Environmental Impact Assessment (EIA) wrongly concludes that the effects to birds and sea mammals will be non-significant and that impacts will occur only during the construction phase. It further states that there is no action or evidence to protect the Coronado Islands as a natural protected area (ChevronTexaco 2003:3-20). However, the exceptional conservation value of these islands has been recognized by the Mexican Federal Congress of the Union, which mandated on July 23, 2003 that the relevant Federal agencies promote a decree to create a natural protected area for the Baja California Pacific islands, including the Coronado Islands, as well as San Benito, Cedros, Guadalupe, San Martín, San Jerónimo, and Todos Santos (Congreso de la Unión 2003). In reality, it is impossible to build the proposed LNG terminal in the vicinity of the Coronado Islands without severe impacts to the species that rely on these islands as habitat. An appropriate distance for the platform to reduce impacts to negligible

levels at the islands is hard to establish, especially without knowing the exact wattage, location, and number of lights on the proposed terminal and supply ships. However, offshore oil rigs in the Santa Barbara Channel that are six miles from Anacapa Island cause elevated light levels on dark nights without a moon (H.R. Carter, pers. comm.). Wherever the terminal is built, lights should have extensive shielding to reduce seabird attraction and collisions.

STATUS OF THE PROJECT AS OF NOVEMBER 2004

In the June 2004 the Grupo de Ecología y Conservación de Islas (GECI) submitted a statement to SEMARNAT, the Mexican ministry of the environment, asking for a resolution to deny ChevronTexaco de México's request for a permit to build the LNG platform at Los Coronado Islands. On 15 September 2004, ChevronTexaco de México received the permit from SEMARNAT in spite of the irregularities in the environmental impact statement highlighted by GECI's request for a negative resolution. Soon after, a request to review the permit was submitted to SEMARNAT by GECI and other

REPORTS – Coronado Islands

TABLE 1. Status of breeding seabirds and Peregrine Falcon on Los Coronados Islands. Data are from Wolf (2002). Historical populations of these species were significantly greater than the current numbers presented here. See text for population trends and threats from proposed development. Abbreviations: B=breeds, population unknown; US =Federal and/or California State status; IUCN=International Union for the Conservation of Nature; CA BSSC=California State Bird Species of Special Concern; THR=threatened; END=endangered; NT=near threatened; VU=vulnerable; X = listed as CA BSSC.

	Population on Islas Coronado	Legal status of species			
		Mexico	US	IUCN	CA- BSSC
Leach's Storm-Petrel (<i>Oceanodroma leucorhoa chapmani</i>)	>200	THR			
Ashy Storm-Petrel (<i>Oceanodroma homochroa</i>)	4-6	THR		NT	X
Black Storm-Petrel (<i>Oceanodroma Melania</i>)	500+	THR			X
Brown Pelican (<i>Pelecanus occidentalis</i>)	1200			END	
Double-crested Cormorant (<i>Phalacrocorax auritus</i>)	600				
Brandt's Cormorant (<i>Phalacrocorax penicillatus</i>)	100				
Pelagic Cormorant (<i>Phalacrocorax pelagicus</i>)	6				
Western Gull (<i>Larus occidentalis</i>)	500				
Xantus's Murrelet (<i>Synthliboramphus hypoleucus scrippsi</i>)	1500-2500	END	THR	VU	X
Cassin's Auklet (<i>Ptychoramphus aleuticus</i>)	B	THR			X
Peregrine Falcon (<i>Falco peregrinus</i>)	4-6			END	

Mexican environmental groups. In October 2004 SEMARNAT agreed that the review request had merit; this enabled an immediate stop order on the project and a review of the permit by a federal judge. However, in order for the review to move forward, it was also determined that the plaintiffs (GECI) must post a bond of US\$6 million, in order to reimburse ChevronTexaco de México for potential lost revenue during the review period. If the review is decided in favor of ChevronTexaco de México, the bond would be forfeited and paid to ChevronTexaco. This requirement limited the ability of small NGOs and citizens' groups to pursue this method of action. In November, GECI applied to a federal judge for an injunction to allow a review without the bond and requesting a review of how the bond amount was set. The results of this action are still pending.

ChevronTexaco de México now needs two more federal permits to proceed with construction: one from

Mexico's Energy Regulatory Commission and another from the Secretariat of Communication and Transportation. Both agencies have already indicated their support for the project. However, a further complication is that the recently elected Mayor of Tijuana, Jorge Hank Rhon, (a prominent businessman) has said he would not allow ChevronTexaco to get the permits needed from Tijuana's municipality. As of November 2004, GECI and other groups are continuing to press legal action. Conservationists' lawsuits and local opposition to the project in Tijuana now appear to be the best hope for stopping this disastrous project.

ACKNOWLEDGEMENTS

We thank Dan Anderson, Harry Carter, Serge Dedina, Frank Gress, Craig Harrison, Gerry McChesney, Bill Powers, Darrell Whitworth, and Shayne Wolf for providing information for and/or comments on this manuscript.

LITERATURE CITED

- Anderson, D.W. 1988. Dose-response relationship between human disturbance and brown pelican breeding success. *Wildlife Society Bulletin* 16: 339-345.
- Anderson, D.W. and J. O. Keith. 1980. The human influence on seabird nesting success: conservation implications. *Biological Conservation* 18: 65-80.
- Carter, H R., D.L. Whitworth, W.R. McIver, J.B. Bulger and G.J. McChesney. (1996). Survey of Xantus' Murrelets (*Synthliboramphus hypoleucus*) and other marine birds at Islas Los Coronados, Baja California Norte, Mexico, on 23-25 April 1995. National Biological Services, California Science Center.
- ChevronTexaco de México. 2003. Terminal GNL Mar Adentro de Baja California. Manifestación de Impacto Ambiental. ChevronTexaco de México, S.A. de C.V. Septiembre de 2003. México, D.F. 628 p.
- Congreso de la Unión. 2003. Punto de acuerdo para que se establezca el área natural protegida de las islas del pacífico de Baja California. LVIII Legislatura. Dirección General Adjunta de Proceso Legislativo. 23 de julio de 2003. México, D.F. 4 p.

REPORTS – Coronado Islands

- Everett, W.T. 1991. Breeding biology of the Black Storm-petrel at Islas Coronados, Baja California, Mexico (Master of Science). University of California, San Diego.
- Everett, W.T. and D.W. Anderson. 1991. Status and conservation of the breeding seabirds on offshore Pacific Islands of Baja California and the Gulf of California. Pages 115-139 in J. P. Croxall, Editor. Seabird status and conservation: A supplement. ICBP Technical Publications, Cambridge, England.
- McChesney, G.J. and B.R. Tershy. 1998. History and status of introduced mammals and impacts to breeding seabirds on the California Channel and northwestern Baja California Islands. Colonial Waterbirds 21: 335-347.
- Palacios, E., F. Gress, D.W. Anderson, L. Alfaro, L. Harvey, and E. Gonzalez. 2003. Seabird status in the Mexican portion of the Southern California Bight. Progress Report. California Institute of Environmental Studies. 26pp.
- Whitworth, D. L., H. R. Carter, R. Young, E. Creel, G.J. McChesney, W.R. McIver and J. W. Mason. (2003). Nocturnal spotlight surveys of Xantus's Murrelets at Islas Los Coronados, Baja California Norte, Mexico, in 2002. Unpublished report, Humboldt State University, Department of Wildlife, Arcata, California.
- Willett, G. 1913. Bird notes from the coast of northern lower California. Condor 15: 19-24.
- Wolf, S. 2002. The relative status and conservation of island breeding seabirds in California and Northwest Mexico. Unpublished MS Thesis, University of California, Santa Cruz.

Bradford Keitt, Island Conservation, Center for Ocean Health, Long Marine Lab, University of California, Santa Cruz, CA 95060, bkeitt@islandconservation.org

Alfonso Aguirre, Grupo de Ecología y Conservación de Islas, Avenida López Mateos No. 1590-3, Ensenada B.C. México, C.P. 22880, aaguirre@islandconservation.org

IMPACTS OF MICE AND OWLS ON SEABIRDS OF SOUTHEAST FARALLON ISLAND

Joelle Buffa and Jesse Irwin

House mice (*Mus musculus*) have been introduced on Southeast Farallon Island (SEFI), and we want to know whether these rodents may have impacts on seabirds that nest on the island. Years of observation led to the hypothesis that the introduced house mouse causes increased seabird predation by Burrowing Owls (*Athene cunicularia*) and Barn Owls (*Tyto alba*).

In this project we are studying relationships between the house mice and Ashy Storm-Petrels (*Oceanodroma homochroa*). Collaborators include PRBO Conservation Science. Predation on seabirds, particularly Ashy Storm-Petrels, increases in late winter. It has been documented on the island by using established "ashy wing walk paths" and by following owls to their roosts to search for wing piles. Incidental observations of mice and the number of droppings vary throughout the year, and trapping was started to quantify mouse population cycles, if any. We hoped reveal whether there is a large population crash of house mice on the island, and if so, whether its

timing coincides with increased predation on Ashy Storm-Petrels by Burrowing Owls.

Mice were trapped on SEFI from March 2001 through March 2004. Four transects were established across SEFI to include all landscapes types on the island. Each transect included 7 traps placed approximately 50m apart. Covered D-con traps were used to prevent gulls from scavenging the carcasses. Traps were set for three consecutive nights at the beginning of each month from March 2001 through March 2004. A second trap session was added to the middle of the month beginning in December 2001.

A total of 4224 trap nights resulted in the capture of 1236 mice during the project. October was the most successful trapping month, with mice captured 71.7% of the time, while April was the least successful month, with captures only 1.2% of the time.

We found a clearly delineated annual cycle in the mouse population. Numbers built gradually from August through

October, stayed high until December, and crashed in January. Timing of the cycle was consistent in all three years.

The results of this project support the suggestion that migrating owls arrive in the fall when mouse numbers are peaking on the island. Most owls move off the island and continue migrating. A few burrowing owls remain long enough to experience the mouse population crash, and when that food source becomes scarce, they switch to Ashy Storm-Petrels. Eliminating mice from the island may prevent migrating owls from trying to over-winter there and preying on storm-petrels. It is possible that removing mice could prevent predation of 100 or more Ashy Storm-Petrels annually.

Joelle Buffa and Jesse Irwin, U.S. Fish and Wildlife Service, San Francisco Bay National Wildlife Refuge, P.O. Box 524, Newark, CA 94560; Joelle_Buffa@fws.gov

REPORTS – Caspian Terns in San Francisco Bay

CASPIAN TERN NESTING ECOLOGY AND DIET IN SAN FRANCISCO BAY

Dan Roby, Ken Collis, Kim Nelson, Keith Larson, and Jessica Adkins

The goal of this study was to develop a better understanding of Caspian Tern (*Sterna caspia*) colony status and diet composition at representative colonies in coastal habitats of northern California. Information from this study will be used in the development of a Caspian Tern Management Plan and Final Environmental Impact Statement (EIS) by the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and National Oceanic and Atmospheric Administration–Fisheries. The Caspian Tern Management Plan and EIS are mandated by a court-mediated settlement agreement. The agreement's goal is to reduce predation on salmonids by Caspian Terns that nest on East Sand Island in the Columbia River estuary.

As in 2003, there were five known breeding colonies of Caspian Terns in the San Francisco Bay area in 2004 (Brooks Island, Knight Island, Baumberg Pond, A-7 Pond, and Agua Vista Park). Approximately 1,350 breeding pairs nested in San Francisco Bay in 2004 (compared to approximately 1,190 breeding pairs in 2003). In both years, most breeding pairs nested on the Brooks Island colony (>75% in 2004).

The predominant prey types for terns nesting at both the Brooks Island and Agua Vista colonies were marine forage fishes, in particular anchovies (Engraulidae), surfperch (Embiotocidae),

herring (Clupeidae), and silversides (Atherinidae). At the Knight Island tern colony, however, salmon smolts were the most prevalent prey type (26.1% of prey items), consisting mostly or entirely of Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*). This population of chinook salmon is not listed under the federal Endangered Species Act (ESA). In general, juvenile salmonids were more prevalent in tern diets in the San Francisco Bay area in 2004 compared to the previous year, but remained a relatively minor proportion of the diet (< 4%) at four of the five colonies. The higher prevalence of salmonids in 2004 tern diets was apparently not a result of higher availability of salmonids, but instead a lower availability of marine forage fishes, particularly northern anchovy and surfperch. These two marine prey types were less prevalent in Caspian Tern diets at all colonies in the Bay area in 2004, in comparison to 2003.

Nesting success at each colony ranged from 0.00 to 0.82 young fledged per breeding pair; and on the whole was lower in 2004 (0.42 young fledged/breeding pair) than in 2003 (0.59 young fledged/breeding pair). The level of productivity observed at colonies in the San Francisco Bay area over the past two years is considered fair to poor, in comparison with other well-studied

Caspian Tern colonies in the region. In 2004, the size of all five colonies appeared to be primarily limited by the availability of suitable nesting habitat above the higher high tide line. Productivity at these colonies was primarily limited by mammalian nest predators, tidal inundation of active nests, human disturbance, and nest predation by gulls during mammalian nest predator and human disturbance events. The lower overall nesting success in 2004 compared to 2003 was primarily due to higher disturbance and nest predation by mammalian predators and a higher incidence of nest inundation during spring tides.

Participants in the study included Oregon State University (OSU), Real Time Research (RTR) and the U.S. Geological Survey. This year's research team included Dan Roby (OSU), Ken Collis (RTR), Kim Nelson (OSU), Keith Larson (OSU), Chris Couch (OSU), Don Lyons (OSU), Rob Suryan (OSU), Anne Mary Myers (OSU), Karen Fischer (OSU), and a number of seasonal technicians and volunteers. This study was funded by the U.S. Fish and Wildlife Service.

Jessica Adkins, Faculty Research Assistant, Oregon State University, Oregon Cooperative Wildlife Research Unit, Corvallis, OR 97731-3803; adkinsj@onid.orst.edu

REPORTS – Terns and Cormorants in the Columbia River

COLONY SIZE, NESTING SUCCESS, AND PREDATION ON SALMON SMOLTS BY CASPIAN TERNS AND DOUBLE-CRESTED CORMORANTS IN THE LOWER COLUMBIA RIVER

Dan Roby, Ken Collis, Jessica Adkins, Kim Nelson, Don Lyons, Anne Mary Myers,
Karen Fischer, Chris Couch, and Garrett Dorsey

Oregon State University and its cooperators continued research on predation by seabirds on salmon smolts (*Oncorhynchus* spp.) in the lower Columbia River. Additionally, they monitored Caspian Tern (*Sterna caspia*) colony size and nesting success, as part of efforts to evaluate management of terns in the Columbia River estuary by federal and state agencies, and Double-crested Cormorant (*Phalacrocorax auritus*) colony size in the Columbia River estuary.

Seabirds, including Caspian Terns, Double-crested Cormorants, Western and Glaucous-winged Gulls (*Larus occidentalis* and *L. glaucescens*), and American White Pelicans (*Pelecanus erythrorhynchos*), prey on juvenile salmonids in the Columbia River estuary and lower Columbia River. Some of these fish are listed under the federal Endangered Species Act (ESA), and therefore agencies are required to take measures to improve salmonid survival in the river. One focus has been to relocate the principal breeding colony of Caspian Terns in the Columbia River estuary, with the aim of reducing predation by terns on salmonids. The tern colony was induced to move from its former site on Rice Island to an artificially-improved site 21km closer to the ocean on East Sand Island. All Caspian Terns nesting in the Columbia River estuary have used East Sand Island during 2001-2004.

In 2004, the size of the Caspian Tern colony on East Sand Island was approximately 9500 pairs (compared to approximately 8325 pairs in 2003), and roughly 8740 fledglings were produced. This corresponds to a nesting success of

0.92 young raised per breeding pair, down from 1.08 young raised per breeding pair in 2002 and 2003. About 6.5 acres of nesting habitat were prepared for the terns on East Sand Island prior to the 2004 nesting season, and terns utilized approximately 4.7 acres for nesting, similar to 2002 and 2003. Juvenile salmonids comprised 17% of the diet of terns at the East Sand Island colony in 2004, compared to 24% salmonids in 2003; this was the lowest proportion of salmonids recorded so far for Caspian Terns nesting in the lower Columbia River. Clupeids (Pacific herring [*Clupea pallasi*] and Pacific sardine [*Sardinops sagax*]), northern anchovy (*Engraulis mordax*), and surfperch (Embiotocidae) were the most prevalent prey in the non-salmonid portion of tern diets.

The size of the Double-crested Cormorant colony on East Sand Island continued to grow in 2004, with individuals nesting in previously unused areas of the island. The colony now consists of approximately 12,000 nesting pairs, the largest known colony of Double-crested Cormorants in North America. Juvenile salmonids comprised less than 5% of the diets of cormorants at this colony in 2004. Northern anchovy, clupeids (Pacific herring and Pacific sardine), and pleuronectids (i.e. starry flounder [*Platichthys stellatus*]) were the most prevalent prey in the non-salmonid portion of cormorant diets. Attempts were made to use habitat modification, decoys, and audio playback systems to attract cormorants to nest in areas of East Sand Island where no nesting had previously occurred; the efforts were successful. However, a similar attempt

to attract cormorants to nest on a different island 24km up-river of East Sand Island was unsuccessful.

Upriver, near the confluence of the Snake and Columbia rivers, the Caspian Tern colony on Crescent Island was estimated to consist of 530 nesting pairs in 2004, similar to 2003. This colony is still the second largest Caspian Tern colony in the Pacific Northwest, after the East Sand Island colony. About 329 fledglings were produced this year, corresponding to a nesting success of 0.62 young raised per nesting pair, slightly higher than in 2003. Juvenile salmonids comprised 70% of the diet of terns in 2004, similar to diet composition during 2000-2003. Most of the non-salmonids observed being delivered to the Crescent Island colony were centrarchids (i.e., bass, sunfish) and cyprinids (i.e., northern pike minnow [*Ptychocheilus oregonensis*] and peamouth [*Mylocheilus caurinus*]). Early in the field season a net pen was deployed near Crescent Island and stocked with approximately 1,000 juvenile rainbow trout tagged with Passive Integrated Transponders (PITs). Goals were to investigate (1) PIT tag deposition rates at the Crescent Island tern colony, (2) vulnerability of fish in different size classes to tern predation, and (3) gull kleptoparasitism rates on fish captured by terns at the net pen.

Participants in the study included Oregon State University (OSU), Real Time Research (RTR), Columbia River Inter-Tribal Fish Commission (CRITFC), U.S. Geological Survey, and the interagency Caspian Tern Working Group (CTWG), including the National Oceanic and Atmospheric Administration Fisheries, U.S. Army

REPORTS – Terns and Cormorants in the Columbia River

Corps of Engineers, U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, Idaho Department of Fish and Game, Columbia River Inter-Tribal Fish Commission, and others. This year's research team included Dan Roby (OSU), Ken Collis (RTR), Kim Nelson (OSU), Don Lyons (OSU), Anne Mary Myers (OSU), Karen

Fischer (OSU), Chris Couch (OSU), Garrett Dorsey (OSU), Bobby Begay (CRITFC), Rob Suryan (OSU), Al Evans (RTR), Mike Hawbecker (RTR), and a number of seasonal technicians and volunteers. This study was funded by the Bonneville Power Administration, the Northwest Power and Conservation Council, the U.S. Army Corps of Engineers, Portland District, and

the U.S. Army Corps of Engineers, Walla Walla District. See www.columbiabirdresearch.org for more information.

Dan Roby, Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University, Corvallis, OR 97331-3808; Daniel.Roby @oregonstate.edu

CASPIAN TERN NESTING ECOLOGY AND DIET AT DUNGENESS NATIONAL WILDLIFE REFUGE, WASHINGTON

Dan Roby, Ken Collis, Kim Nelson, Kirsten Bixler, and Jessica Adkins

A better understanding of Caspian Tern (*Sterna caspia*) colony status and diet composition at representative colonies is needed for coastal habitats of Washington. Information from this study will be used in the development of a Caspian Tern Management Plan and Final Environmental Impact Statement (EIS) by the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and National Oceanic and Atmospheric Administration Fisheries. The Caspian Tern Management Plan and EIS are mandated by a court-mediated settlement agreement, with the goal of reducing predation on salmonids by Caspian Terns nesting on East Sand Island in the Columbia River estuary.

We studied Caspian Tern nesting ecology and diet composition at a colony on the Washington coast in 2004. This tern colony is on Dungeness Spit in Dungeness National Wildlife Refuge (NWR), and it evidently formed for the first time during the 2003 nesting season. It was located on sandy substrate

amongst driftwood approximately one mile southwest of the Dungeness Lighthouse National Historic Site. We estimated that there were 233 to 293 breeding pairs at the site, and that 211 to 295 young were fledged, or 0.80–1.12 young fledged per breeding pair in 2004. Nesting success at Dungeness Spit was considered good compared to other well-studied Caspian Tern colonies in the region, and it was surprisingly high considering that most early nesting attempts at the site failed due to frequent visits to the colony by a coyote (*Canis latrans*). In addition, raccoon (*Procyon lotor*), opossum (*Didelphis marsupialis*), weasel (*Mustela* spp.), and river otter (*Lutra canadensis*) tracks were seen in the vicinity of the colony, and a river otter was observed on the colony site during the day. Mammalian predators, and to a lesser extent gull (*Larus* spp.) predation and human disturbance, were the primary limiting factors for colony size and nesting success at Dungeness Spit. The diet of terns nesting at Dungeness NWR

consisted mostly of surfperch (Embiotocidae; 36%) and salmonids (Salmonidae; 29%). Presumably some of the salmonid smolts consumed by this tern colony were released from the Dungeness Hatchery, located on the Dungeness River approximately 14 km upstream from the mouth.

Participants in the study included Oregon State University (OSU), Real Time Research (RTR), and U.S. Geological Survey. This year's research team included Dan Roby (OSU), Ken Collis (RTR), Kim Nelson (OSU), Kirsten Bixler (OSU), Sarah Moculeski (OSU), Chris Couch (OSU), Don Lyons (OSU), Rob Suryan (OSU), Anne Mary Myers (OSU), Karen Fischer (OSU), and a number of seasonal technicians and volunteers. This study was funded by the U.S. Fish and Wildlife Service.

Dan Roby, Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University, Corvallis, OR 97331-3808; Daniel.Roby @oregonstate.edu

CONSERVATION REPORT

Compiled by Craig Harrison

WAKE ATOLL APPARENTLY CAT-FREE

The Department of Defense Legacy Grant project "Conservation of Indigenous Seabirds at Wake Atoll" has been successfully completed by the Endangered Species Recovery Council, Wildlife Management International of New Zealand, and Marine Endeavors. In July 2003, team members began a concerted effort to remove feral cats that were causing significant damage to indigenous seabird populations on the atoll. Three extended visits were made during 2003 and 2004 to conclude ongoing control efforts and to eradicate the cats. By January 2004, the task appeared virtually complete; about 170 cats had been removed from the three islets of the atoll.

In July and August 2004, three team members spent six weeks searching for evidence of feral cats and found none. The team probably had been successful in removing all feral cats (two spayed pets remain on the atoll). However, several years without cat sightings will be required to confirm the absence of feral cats. Funding is needed to conduct additional searches for feral cats and to monitor seabird recovery.

The benefits of removing feral cats were immediately apparent. Booby populations increased as soon as cat control was initiated. Masked Boobies (*Sula dactylatra*) increased from 3 breeding pairs in 1996 to 20 by 2004; Brown Boobies (*Sula leucogaster*) went from 73 nests in 1996 to 162 in 2003. Wedge-tailed Shearwater (*Puffinus pacificus*) populations expanded to form at least three colonies, with individuals seen at many places around the atoll. By August 2004, Gray-backed Terns (*Sterna lunata*), a species not recorded breeding on the atoll since the 1980s, were raising young in two new colony sites. Bristle-

thighed Curlews (*Numenius tahitiensis*) are wintering on the atoll for the first time in a long while. The project has also enhanced awareness of personnel on Wake regarding birds, and consequently bird nesting areas are now afforded better protection from human disruption.

Some seabirds are immigrants from Johnston Atoll and French Frigate Shoals, Hawaii. The team recorded 26 banded birds throughout the project and reported the band numbers to the National Banding Laboratory. They also salvaged specimens of dead birds and rats for the U.S. Fish and Wildlife Service (USFWS), Smithsonian Institution, and San Diego Natural History Museum. One bird species was identified as a Fluttering Shearwater (*Puffinus gavia*) from New Zealand, which has never been recorded far from that country. The team recorded 44 species of birds for Wake, an increase since the last count of 31 species in 1996.

Pacific (Polynesian) rats (*Rattus exulans*) have increased, due in part to removal of feral cats and probably enhanced by wet conditions and natural population cycles. The rodents have reached the point of becoming a nuisance. The population appears to have peaked in April 2004 and is now declining. The rodenticide Bromadiolone (ContractTM) has been placed around buildings and roads, and rats are not common around the main living or working areas. Rats appear to prefer large open grassy areas next to shrub cover. The team trapped around the harbor area to confirm that no other rat species were present. Current rodent control efforts are less effective than they should be because hermit crabs eat the bait, which is not toxic to them, before rats can consume it. Bait stations need to be placed off the ground to avoid crab scavenging. Current bait station designs for placement in trees are only partially successful. Effec-

tive rat control or eradication will require a method for placing poison bait without crab interference. The U.S. Air Force is investigating rat eradication options. Finally, a no-cats-allowed policy needs to be clearly communicated and enforced on Wake Atoll.

—Mark J. Rauzon

NMFS SUED TO ENJOIN SWORDFISH LONGLINE FISHERY IN HAWAII

In late August, the Center for Biological Diversity and two other environmental groups filed suit against the National Marine Fisheries Service (NMFS; also known as NOAA-Fisheries) to enjoin reopening of the Hawaii-based longline swordfish fishery. The environmental groups allege violations of several environmental statutes. They claim the fishery will cause the deaths of Black-footed Albatross (*Phoebastria nigripes*) and Laysan Albatross (*P. immutabilis*), both protected by the Migratory Bird Treaty Act, as well as endangered sea turtles protected by the Endangered Species Act. They also allege that the fishery was reopened without a proper environmental impact statement, in violation of the National Environmental Policy Act, because it omitted any meaningful discussion of the fishery's impacts on seabirds.

Judge David Ezra closed the swordfish fishery in 2000 when NMFS had failed to prepare a required environmental impact statement (*Pacific Seabirds* 27:62, 2000). When NMFS did review the fishery's impacts in 2001, it concluded that the fishery was harming endangered sea turtles; the agency closed the swordfish fishery, while allowing the

CONSERVATION REPORT

tuna fishery to continue. This decision also benefited albatrosses. In April 2004, NMFS reopened the swordfish fishery and required longliners to use a different combination of hook and bait that it hopes would reduce deaths of sea turtles.

Before it was closed, the swordfish fishery, which sets the hooks much closer to the surface than does the tuna fishery, caused the deaths of many Black-footed and Laysan Albatrosses each year. The birds dive on the baited longline hooks, are snagged, and drown. Modelers have attempted to predict the Black-foot's population trends. Assuming 10,000 deaths per year in longline fisheries, some models predict that Black-foot numbers might drop precipitously during the next six decades. However, actual population trends of this species on colonies appear to be either stable or increasing, depending upon the time frame that is analyzed (stable over the past decade, increasing in the past 50 years)

Deaths of albatrosses would likely decline if longliners were required to set over the side of the vessel, but NMFS does not require longliners to use side-setting techniques. The Migratory Bird Treaty Act prohibits capturing or killing albatrosses or other migratory birds without a permit; however, the courts have not yet decided how rigorously this requirement should be applied to fishery bycatch.

The plaintiffs have filed a motion for a preliminary injunction, asking the court to close the swordfish fishery until NMFS complies with environmental laws. The Longlining Fishery Association has intervened in the lawsuit. As of early December, the court has not enjoined the fishery and is considering the government's motion to dismiss the case.

ESA STATUS SOUGHT FOR BLACK-FOOTED ALBATROSS

In late September, two environmental groups petitioned the U.S. Fish and

Wildlife Service to list the Black-footed Albatross as an endangered or threatened species under the federal Endangered Species Act. The immediate reason for this action was the reopening of the Hawaii-based longline fishery for swordfish in April 2004. According to the petition, the fishery is likely to result in drowning deaths of "several thousand Black-footed Albatross each year." No justification was provided for this estimate, which seems excessive based on the number of Black-foots taken before the fishery was closed in 2000.

The Center for Biological Diversity and Turtle Island Restoration Network said, "Unless we act now, longlining will cause the extinction of the Black-footed Albatross." They note that the species has not fully recovered from the depredations of the 19th and early twentieth centuries, when Japanese killed the birds for their plumes on colonies throughout the Central Pacific. The current population is over 300,000 individuals (almost 60,000 breeding pairs). Albatrosses still have not returned to some former colonies. The petitioners point to the serious problems with albatrosses and longlining in the Southern Hemisphere, although such problems are less apparent in the Northern Hemisphere.

BirdLife International and the World Conservation Union have recently concluded that the Black-footed Albatross should be classified as endangered under IUCN criteria. The petition can be found at <http://www.seaturtles.org/pdf/ACF5D.pdf>

PSG COMMENTS ON DRAFT EIS FOR CASPIAN TERN MANAGEMENT

PSG submitted comments in August on the draft environmental impact statement (DEIS) for Caspian Tern Management in the Pacific Northwest, which was issued by USFWS. PSG has long criticized the science behind NMFS's presumption that the consumption of salmon

smolts by Caspian Terns (*Sterna caspia*) has a severe detrimental effect on wild stocks of adult salmon. The DEIS failed to analyze the actual return of wild stocks of adult salmonids as a function of tern predation on smolts. Instead, it focused on changes to smolt populations, even though 90% of the smolts consumed by terns are hatchery smolts, not wild smolts. PSG noted that salmonid returns in the Columbia River have been increasing remarkably during the period in which NMFS contends that Caspian Terns have been devastating them. This is contrary to certain model predictions. In addition, the DEIS failed to acknowledge that tern predation of smolts has dropped by two-thirds in recent years.

Under the National Environmental Policy Act and its regulations, a DEIS must provide a full and fair discussion of environmental impacts, discuss direct and indirect effects, and provide means to mitigate adverse environmental impacts. PSG stated that the DEIS does not meet these criteria and noted that scientists at NMFS' own scientists have raised fundamental questions about the agency's approach. PSG requested that the final EIS compare smolt consumption by terns with adult salmonid returns in order to evaluate the hypotheses regarding the impacts of terns on salmonid populations.

PSG also questioned why ownership decisions concerning East Sand Island have been deferred for many years. PSG asked USFWS to acquire and manage East Sand Island as a National Wildlife Refuge in September 2000 (Pacific Seabirds 27:65, 2000), but still no decision has been made. PSG noted that in addition to supporting the largest Caspian Tern colony in the world, East Sand Island has the following seabird resources: (1) the largest breeding colony of Double-crested Cormorants (*Phalacrocorax auritus*) in North America (over 12,000 breeding pairs in 2004), (2) the largest known roosting aggregation of California Brown Pelicans (*Pelecanus occidentalis*) anywhere (nearly 11,000 counted on the island at

CONSERVATION REPORT

one time), (3) one of the largest breeding colonies of Western/Glaucous-winged Gulls (*Larus occidentalis* / *L. glaucescens*) on the western coast of North America (ca. 7,000 breeding pairs), (4) an unusual estuarine breeding colony of the typically coastal nesting Brandt's Cormorant (*P. penicillatus*), and (5) a breeding colony of Ring-billed Gulls (*L. delawarensis*) (ca. 800 breeding pairs). PSG observed that this is the largest unprotected seabird colony in North America.

PSG supported modified Alternatives A and C in the DEIS. Alternative A would maintain the current management. Alternative C would reduce the tern nesting habitat on East Sand Island from about 4.3 acres to 1.0–1.5 acres in an attempt to reduce the population there from about 9,000 pairs to about 3,000 pairs (a 60-70% reduction). In compensation, USFWS would create twice as much nesting habitat elsewhere at various locations in Washington, Oregon, and California in an attempt to lure the terns elsewhere. This attempted redistribution would be accomplished gradually over a period of several years. PSG noted that it has no objection to dispersing the Caspian Tern colony at East Sand Island, so that many of the terns breed elsewhere. However, PSG does not support further decimating the current population of Caspian Terns (which has declined from a high of 14,534 pairs in 1998 to 9,000 pairs in 2004) if the terns do not actually move to other nesting colonies. PSG suggested employing the principles of adaptive management to provide additional time for habitat creation, or to employ different approaches if the dispersed terns do not nest elsewhere.

Finally, PSG strongly opposed Alternative D (redistribution and lethal control on East Sand Island), which could result in "killing up to 50 percent of breeding adult terns each year."

MARKET SQUID FISHERY MANAGEMENT PLAN AND

SEABIRD PROTECTION MEASURES

PSG wrote to the California Fish and Game Commission in October to express its concern about the commission's recent actions on the Market Squid Fishery Management Plan. The commission has removed critical measures to protect seabirds in the Channel Islands, particularly the Xantus's Murrelet (*Synthliboramphus hypoleucus*), which recently received protected status under the California Endangered Species Act. On a more positive note, the Commission did adopt closures in the Gulf of the Farallones National Marine Sanctuary, an issue that has been a concern to PSG (*Pacific Seabirds* 30:86, 2003).

During the Commission's consideration of the listing petition for the murrelet, it created seasonal closures around California's largest murrelet colonies at Santa Barbara and Anacapa islands and prohibited the use of bright lights within one nautical mile of those islands (*Pacific Seabirds* 29:97, 2002; *Pacific Seabirds* 31:5, 2004). These interim regulations addressed one of the greatest threats to the species, artificial lights near breeding colonies. Now that the Xantus's Murrelet has been listed, the interim regulations no longer are in force. Ironically, the species was better protected during the interim listing process than since it was formally listed. The impact of bright lights near island nesting colonies was one of several factors that led to the listing of this nocturnal seabird and is mentioned in the Department of Fish and Game's press release on the listing decision.

PSG asked the Commission to reconsider the closures at Anacapa and Santa Barbara islands at their October meeting and vote to adopt them. Unfortunately, the closures still have not been adopted.

HABITAT CONSERVATION PLAN THAT AFFECTS

ENDANGERED SEABIRDS ON KAUAI

In response to a request from USFWS, PSG provided its opinions on issues that should be addressed in the review of a proposal by Kauai Island Utility Cooperative to develop a Habitat Conservation Plan on Kauai. This plan may include an incidental take permit for Newell's Shearwaters (*Puffinus puffinus newelli*), Hawaiian Petrels (*Pterodroma sandwichensis*), and Band-rumped (Harcourt's) Storm-Petrels (*Oceanodroma castro*). PSG has previously addressed similar issues with the company (*Pacific Seabirds* 28:13, 2001).

PSG noted that Newell's Shearwaters seem to be seriously declining and that the proposed Habitat Conservation Plan will cover virtually all activities by the company, including the construction, operation and maintenance of generating stations, power lines, utility poles, and lights. PSG suggested that the environmental review requires a full environmental impact statement and not merely an environmental assessment.

The company has been sued previously for "taking" Newell's Shearwaters. That case was settled when the company agreed to fund a study by the Electric Power Research Institute (EPRI) on the conservation of Newell's Shearwaters. The study resulted in many specific recommendations to reverse the population decline; however, few of these recommendations have been implemented. PSG stated that the EPRI report provides a range of reasonable alternatives that should be used in any incidental take permit or Habitat Conservation Plan to mitigate the take of Newell's Shearwaters. Among the actions that PSG supported are analysis of shielded street lights, design of power lines to reduce the risk of seabird collisions, and placing critical line segments underground. PSG also agreed that it is important to assess how effective the rescue and rehabilitation of grounded seabirds has been, and to develop information that would allow us to conserve these spe-

CONSERVATION REPORT

cies better.

PSG urged USFWS to revise the 1982 Recovery Plan for Newell's Shearwaters and Hawaiian Petrels, which is out of date and has never been implemented (see *Pacific Seabirds* 27:23, 2000). PSG also urged USFWS to establish predator-free Newell's Shearwater colonies, an activity that was begun in the 1980s by FWS and later abandoned. PSG noted that while the dramatic decline of Newell's Shearwaters makes this the most important species to be addressed, the status of the Hawaiian Petrel remains problematic. Finally, surveys of Harcourt's Storm-Petrels indicate that only a few hundred remain in Hawaii (all of them on Kauai), despite the fact that they were formerly so common that they are abundant in prehistoric middens.

UPDATE ON KISKA ISLAND AUKLET-RAT ISSUES

Ian Jones has issued an updated report on the predation of Least and Crested Auklets (*Aethia pusilla* and *A. cristatella*) by Norway rats (*Rattus norvegicus*) on Kiska Island in the Aleutians (see *Pacific Seabirds* 30:9-10, 2003). Least Auklets at Sirius Point suffered virtual breeding failure during 2001 and 2002 when rats were abundant; but during 2003 and 2004, when rats were scarce, their productivity was similar to rat-free islands. Survival rates of adult auklets were high (89% and 95%) in the two years when rat sign was abundant and productivity was low. The report suggests that rat predation does not reduce auklet annual survival significantly at Sirius Point, but that introduced Norway rats can cause auklet breeding failure at Kiska.

The report states that modeling should be employed to assess the likely impact of different frequencies of breeding failure on the future size of the auklet population breeding at Sirius Point. If the colony experiences failures similar to those in 2001-2002 in half of the future years, it could decline to near extinction within 30 years.

The report also suggests that a quantitative method for monitoring rat populations should be implemented. Rat population ecology needs to be studied quantitatively at Kiska to ascertain the causes of the drastic inter-annual population fluctuations that were observed. Finally, auklet productivity and survival and rat activity should be further monitored, since both auklet and rat demography fluctuate. The report is available at <http://www.mun.ca/acwern/Kiska2002.html>

USFWS RULES NORTHWEST MARBLED MURRELET POPULATION NOT DISTINCT

The U.S. Fish and Wildlife Service decided in September that Marbled Murrelets (*Brachyramphus marmoratus*) in Washington, Oregon, and California are no different from those in British Columbia and Alaska. This decision has spurred USFWS to reanalyze whether the bird should be protected under the Endangered Species Act at all (*Pacific Seabirds* 31:5, 2004).

Five-year reviews are required under the Endangered Species Act, but this review was initiated by a timber industry lawsuit, which pointed out that USFWS had not done a review of the murrelet since it was listed in 1992. Independent scientists hired by USFWS found that Marbled Murrelets in California, Oregon, and Washington have decreased by 10% since listing. Based on that analysis, policymakers in USFWS's regional office in Portland concluded in their draft review in April that the birds are indeed a distinct population that is suitable for listing.

But the Washington, D.C. headquarters of USFWS overruled the regional office's determination and concluded that murrelets do not qualify as a distinct population segment. They referred to by the 1996 policy on "Distinct Population Segments" issued

jointly by USFWS and NMFS. Under that policy, a distinct population segment is defined by two major characteristics: (1) there must be biological differences among different groups of the species, and (2) if there is an international boundary, the conservation, management, and habitat for the animal must be significantly different on opposite sides of the border. Under the analysis by the Washington office of USFWS, there is no marked distinction in physical, ecological, or behavioral attributes of the species at the U.S.-Canada border, and there is no significant evidence of genetic or morphological discontinuity there. USFWS's Washington office also determined that there are no significant differences in control, exploitation, habitat management, conservation status, or regulatory mechanisms across the international border. This conclusion seems to be based upon the fact that Canada passed a species protection law in the summer of 2004.

PSG wrote to the USFWS Director concerning this issue in November. We noted that no data were provided to demonstrate that the species' population was stable or to show that protection is not needed. In addition, further information reviewed by PSG indicates significant differences in management of the species and habitat between Canada and the U.S.

With respect to the status review of the Marbled Murrelet throughout its entire range, PSG stated that, in our professional opinion, the Marbled Murrelet in California, Oregon, and Washington constitutes a *bona fide* distinct population segment under the 1996 policy. Even though Congress directed USFWS to list Distinct Population Segments "sparingly," PSG believes that the Marbled Murrelet in the tri-state area is such an instance. PSG requested that USFWS reconsider some of the conclusions that it reached during the five-year review. Among other things, PSG suggested that additional work be undertaken to determine whether there are genetic differences between the population in Canada and that in the tri-state area. The genetic

CONSERVATION REPORT

work conducted to date has not been designed to directly address this question but suggests that populations from California and the Aleutian Islands differ both from each other and from populations in British Columbia and mainland Alaska.

PSG suggested that the five-year status review consider additional data on the status of the species throughout its range, nest failure due to human disturbance and habitat fragmentation, and the continuing loss of nesting habitat despite the Northwest Forest Plan. PSG noted that new data indicate that the species is declining throughout significant portions of its range in Alaska, which also should be analyzed and addressed.

PSG recommended that the status review be conducted by those regional biologists, both within and outside the USFWS, who are most familiar with the ecology and population status of the species. Finally, PSG noted that its Marbled Murrelet Technical Committee has long been both a catalyst and an unbiased forum for resolving many of the questions related to the conservation and the biology of Marbled Murrelets.

NATIONAL AUDUBON SOCIETY DECRIMES DECLINE IN BIRD POPULATIONS

Nearly a third of North American bird species are in significant decline, largely because of environmental deg-

radation, according to the National Audubon Society. In October 2004, The organization released a "State of the Birds" report on the health and abundance of 654 species of birds of the continental United States.

Factors for the decline include the loss of wetlands to development and agricultural activities, the loss of native grasslands, overgrazing of grassland and shrubland, poor forest management, invasive species, pollution, and poor land-use decisions.

Population declines were measured from 1966 through 2003 using data from the Breeding Bird Surveys, which are carried out across North America by volunteers coordinated by the U.S. Geological Survey. Sixteen species of birds were listed as having declines ranging from 67 percent to 97 percent. Another 10 species of birds from smaller sample sizes had similar numbers. In contrast, the Whooping Crane (*Grus americana*) has increased to 400 birds. It was on the edge of extinction in the 1930s with fewer than 20 birds left in the wild.

The report recommends more funding for the Land and Conservation Fund (which is financed through oil and gas development royalties and helps pay for habitat conservation), increased funding for research into invasive species, reauthorizing the Endangered Species Act, and addressing global climate change. The report is available at <http://www.audubon.org/bird/stateofthebirds/>

MBTA AMENDMENT BECOMES LAW

President Bush signed the omnibus spending bill in December 2004, which included amendments to the Migratory Bird Treaty Act (MBTA). Henceforth the MBTA's protection will no longer cover at least 94 exotic, human-introduced avian species, including European Starlings (*Sturna vulgaris*), House Sparrows (*Passer domesticus*), and Rock Pigeons (*Columba livia*), even though families to which these species belong are mentioned in the migratory bird conventions. PSG supported this legislation, along with about 60 other bird organizations working with the American Bird Conservancy (*Pacific Seabirds* 31:8-9, 2004). PSG's concern was that problems could have arisen with management of introduced bird species that harmed native seabirds. The bills were approved by the appropriate committees in the House and Senate, but for a time they were blocked from movement to the floor by animal rights groups such as The Fund for Animals and the Humane Society. The legislation restores an 80-year-old policy by USFWS and state wildlife agencies that applied the MBTA to native avian species but not to human-introduced, non-native species. Under *Hill v. Norton*, 275 F.3d 98 (D.C. Circuit, December 28, 2001), the introduced Mute Swan (*Cygnus olor*) was afforded protection under the MBTA.

A companion measure that would have extended and improved the Neotropical Migratory Bird Conservation Act was not added to the Omnibus Bill.

SEABIRD NEWS

SHORT-TAILED ALBATROSS BREEDING POPULATION EXPANDS TO NEW COLONY

The breeding population of Short-tailed Albatrosses (*Phoebastria albatrus*) on Torishima has increased again during the 2004-2005 season. Hiroshi Hasegawa visited the island from 22 November to 4 December 2004 (his 88th field trip there). A total of 302 pairs nested this season, an increase of 25 pairs (9%) over the 2003-2004 season. Two hundred ninety-six pairs nested at the original colony on southeastern Torishima, an increase of 20 pairs over last season. This colony is located on steep volcanic scree, and Hasegawa has supervised habitat restoration there (erosion control and transplanting of grass), which has led to improved breeding success. The original colony has begun to expand in area—2 new pairs nested at the top of the cliff in 2004, 500m from the original colony. A few Black-footed Albatrosses (*P. nigripes*) have also settled there over the past five years.

An intensive effort has been made to establish a new Short-tailed Albatross colony on the northwest side of Torishima, using decoys and playback of calls. One lone pair has nested in this area for the past 10 years (always in the same spot). This season the faithful birds were joined by three new incubating pairs. It appears that the improvement of breeding success at the original colony has led to increased crowding there, with the result that returning immature birds may be encouraged to settle in new sites. Hasegawa writes, “The present success in establishing a new colony should reduce the impact of natural disasters like landslides or mud flows of volcanic ash on the nesting of Short-tailed Albatrosses, and it [should] allow them to exhibit their potential ... of breeding.” This news is extremely encouraging for

all who are working on the Short-tailed Albatross's recovery.

WIDESPREAD SEABIRD BREEDING FAILURE IN NORTHERN BRITAIN

A variety of seabird species experienced extremely poor breeding success in northern Scotland in summer 2004, according to the *Seabird Group Newsletter* (number 98, November 2004). Species with low or zero productivity in some areas included not only surface-feeders such as terns (*Sterna spp.*) and Black-legged Kittiwakes (*Rissa tridactyla*), but also several that feed in the water column, such as Common Murres (*Uria aalge*), Razorbills (*Alca torda*), and Shags (*Phalacrocorax aristotelis*). Poor productivity extended from the Shetland Islands to the mainland and islands near Edinburgh. In contrast, colonies in western Scotland had better success—in some cases very high. The cause of breeding failure appeared to be a severe scarcity of sandeels (*Ammodytes marinus*). A recent government brochure on seabirds states that in some areas where 2004 breeding failed 2004, the sandeel fishery has been closed for four years, so fishery pressures are not the principal cause. Instead, sandeel stocks appear to have declined in response to warm sea temperatures in the region (Joint Nature Conservation Committee, “UK Seabirds in 2004: results from the UK Seabird Monitoring Programme”; JNCC, Dunnet House, Aberdeen, Scotland; www.jncc.gov.uk/seabirds)

INDIAN OCEAN SEABIRD GROUP IS FORMED

Researchers and conservationists who work on seabirds of the western Indian Ocean decided in November 2004 to form an international group that will focus on seabird ecology and conservation in their area. The Indian Ocean Seabird Group (IOSG) was created during 11th Pan African Ornithological Congress, which was held at Djerba (Tunisia) on 20–25 November. To date the IOSG includes members from South Africa, Mozambique, Tanzania, Kenya, Djibouti, Seychelles, Madagascar, Mauritius and Réunion, and people from the United States, Portugal, Belgium, the United Kingdom, Canada, and France who are involved in seabird studies or conservation projects in the Indian Ocean. They welcome new members who work with seabirds anywhere in the Indian Ocean.

The goals of the new group are:

1. To increase knowledge of the status and ecology of seabirds that breed in the intertropical region of the Indian Ocean, and of threats to these species.
2. To facilitate exchanges of information between researchers, conservationists and managers involved in seabird ecology or management.
3. To conduct joint projects at the scale of the Indian Ocean.
4. To engage and liaise with national seabird groups and to assist in their work (for instance, the Seychelles Seabird Group).

Activities that the IOSG will consider undertaking include:

- Conducting surveys and censuses at remote and poorly known islands
- Developing an updated database on seabirds of the Indian Ocean
- Organizing workshops and symposia on seabird ecology, conservation, and other topics
- Developing standardised methods for censusing and study of breeding populations

SEABIRD NEWS

- Updating the conservation status of seabirds
- Providing government agencies and international conservation groups with expert advice and updated information on seabird conservation and threats
- Conducting or encouraging conservation actions for endangered species and vulnerable habitats
- Circulating a newsletter among members with the latest developments on research and conservation on Indian Ocean seabirds
- Establishing a website for the IOSG, with information and links; establish and update a website on seabirds of the Indian Ocean
- Publishing a journal dedicated to the seabirds of the Indian Ocean...

This list is not exhaustive.

Although the main focus of the IOSG is the tropical zone of the Indian Ocean, the temperate and subantarctic parts of the Indian Ocean are also of major interest for seabirds. The group welcomes members involved in research or conservation programs throughout the Indian Ocean.

The present group is focused mostly on the western Indian Ocean because current members are from this region or are working there. However, they especially welcome members from the northern and eastern Indian Ocean, since they all share the same species, marine habitats, and conservation issues. (Seabirds disperse clear across the Indian Ocean, as shown by satellite tracking and a few

ring recoveries!)

Anyone interested in joining the IOSG is invited to contact Dr. Matthieu Le Corre, IOSG coordinator, at lecorre@univ-reunion.fr Please provide your name, working address, organization, and email. We will put you on our mailing list, and you will be informed about the activities and development of this brand-new seabird group.

PSG congratulates the members of the new Indian Ocean Seabird Group, and offers our support. (Please see also the editorial on page 42.)

SEABIRD GROUP MEETING IN SCOTLAND, SEPTEMBER 2006

The Seabird Group (of the United Kingdom) has announced that its next conference will be held 1–3 September 2006, at Aberdeen University in Scotland. The theme will be “Seabird populations under pressure.” A call for papers and registration information will be issued in mid-2005.

The venue is the same as for the previous meeting (March 2004). The conference hall is located in the 500-year-old original buildings of the university. However, the facility is very up-to-date and comfortable—fit for a parliament to meet in, and in fact one did meet there within the past few years. Accommodations are in the university’s dormitory rooms.

For more information contact Mark Tasker, the current Chair of the Seabird Group; his e-mail is mark.tasker@jncc.gov.uk.

CONFERENCE ON MARINE PROTECTED AREAS IN AUSTRALIA, OCTOBER 2005

The first International Marine Protected Areas Congress will meet at Geelong, Australia on 23–27 October 2005. Goals are to review the entire global range of marine protected areas (MPAs), including environments from inshore and reefs to the high seas. MPAs to be considered at the congress are all those falling within criteria of the International Union for the Conservation of Nature. Characteristics and future management of MPAs will be reviewed. A particular goal will be to encourage closer cooperation between conservationists and fishers. These two groups are often opposed to each other, yet protected areas established by either group are likely to benefit organisms that the other cares about (as well as biodiversity in general).

The deadline for submitting papers has passed, but registration is open. The conference’s web site is at <http://impacongress.org> (*Editor’s note:* I was not able to open this page, but a brochure on the congress can be downloaded from <http://www.parkweb.vic.gov.au>)

PSG NEWS

PSG ELECTION SLATE

Ballots for PSG's 2005 Executive Council were mailed in early December. Candidates included:

Officers

Chair: Katie O'Reilly

Vice-chair for Conservation: Craig Harrison

Treasurer: Ron LeValley

Regional representatives

Canada: Gail Fraser, Ken Morgan

Southern California: Dan Robinette

Non-Pacific United States: Melanie Steinkamp

Oregon-Washington: Adrian Gall

Election Chair Pat Baird included this reminder on the ballot: "Regional representatives—*Vote only for candidates in your region and only if your region is listed!*" It will be interesting to see whether our highly educated members will heed this plea; so far, some of us haven't!

NEW COORDINATOR FOR XANTUS'S MURRELET TECHNICAL COMMITTEE

The Xantus's Murrelet Technical Committee's mandate is to monitor the status of petitions to list the species under the federal and California endangered species acts, keep abreast of research findings and conservation issues, and provide information to interested parties. In the recent past, the committee prepared PSG's petitions for listing of the Xantus's Murrelet by both the state of California and the U.S. Fish and Wildlife Service. Listing under the California Endangered Species Act was approved by the California Fish and Game Commission earlier this year (although the listing has not yet been made official). The petition for federal listing seems to be sleeping.

Following the committee's hard work on listing the species, the Execu-

tive Council decided to retain the committee but to allow its coordinators to retire. Recently the Chair, Dan Roby, appointed Gerry McChesney as the committee's new coordinator. McChesney was a prime mover of the petitions, and he continues to be active in research, monitoring, and conservation of the Xantus's Murrelet.

Current major conservation issues surrounding the Xantus's Murrelet are the recently approved Market Squid Fishery Management Plan for California, and a proposal by ChevronTexaco to build a liquid natural gas plant just offshore of Islas Los Coronados, Baja California (see the Report by Brad Keitt and the Conservation Report in this issue). Several members of the Xantus's Murrelet Technical Committee, as well as Craig Harrison, Vice Chair for Conservation, have been very active in monitoring these issues on behalf of PSG.

—Dan Roby

REGIONAL REPORTS

Regional reports summarize current seabird work of interest to PSG members. Regional Reports generally are organized by location of the work, not by affiliation of the biologist. They should not be cited without permission of the authors.

The Regional Reports for Southern California, the Russian Far East, and most of Hawai‘i and the Pacific Rim were not received by press time. Missing reports may be submitted for publication in the Spring 2005 *Pacific Seabirds*.

ALASKA

Compiled by **Verena A. Gill**

BEAUFORT SEA

George Divoky monitored Black Guillemot (*Cephus grylle*) breeding success and chronology on Cooper Island in 2004, 30 km southeast of Point Barrow. Nonbreeding Horned Puffins (*Fratercula corniculata*) caused the death of approximately one-third of all nestlings. Four Horned Puffin pairs bred on the island, the highest number since puffins first bred there in 1986.

CHUKCHI SEA

Annual seabird monitoring was conducted at Cape Lisburne by Alaska Maritime National Wildlife Refuge (AMNWR). **Dave Roseneau** and **Jim Schneeweis** evaluated reproductive success and population trends of Black-legged Kittiwakes (*Rissa tridactyla*) and Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*).

BERING SEA

Ed Murphy conducted monitoring at Bluff in Jun 2004 to determine breeding chronology of Common Murres and Black-legged Kittiwakes, and a second trip in late Jul to early Aug to count adults and determine breeding success on permanently established plots. Comparison of these data with previous years suggests that murre numbers have remained stationary or increased slightly since the late 1970s. Murre breeding chronology was early in 2004 relative to previous years, and breeding success was intermediate. Kittiwake numbers were comparable to those in the late 1970s; numbers in-

creased until the early 1990s but have decreased since. Kittiwake breeding chronology was early relative to previous years, and many broods contained 2 chicks in late July. However, most broods contained only 1 live chick several days later. After the late July count, more and more kittiwake nests were unattended by adults during nest checks on successive days. On 4 August, the last day of observations, no adult was present at 35% of the nests with 1 or 2 chicks. It appears that forage foods for kittiwakes had become scarce by early August—no feeding melees of kittiwakes were seen near the colony. A colony-wide search for Pelagic Cormorant (*Phalacrocorax pelagicus*) nests in early August indicated that cormorant breeding success was exceptionally high; most broods contained age class 5 chicks (adult-size) and average brood size for all nests was 2.5 chicks. Several cormorant nests contained 4 adult-size chicks.

Art Sowls (AMNWR) coordinated seabird monitoring on the Pribilof Islands and continued to oversee the land-based rat prevention program. On St. George, **Greg Levandoski** and **Katie Kauffmann** recorded timing of nesting events, reproductive success, and food habits of Red-legged (*Rissa brevirostris*) and Black-legged Kittiwakes and Common and Thick-billed Murres, and survival of kittiwakes. **Martin Renner** continued studying survival of Least Auklets (*Aethia pusilla*), including banding and resighting birds at the Ulakaia colony. **Heather Renner** mapped the Least Auklet colony using a new protocol being developed by PSG members. **Shiway Wang** (University of Alaska Fairbanks;

UAF) and **Scott Hatch** (U.S. Geological Survey; USGS) collected samples of fat, stomach oil, and blood from Northern Fulmar (*Fulmarus glacialis*) adults and chicks on St. George. On St. Paul Island, **Sadie Wright** and **Alexis Will** monitored timing of nesting events, reproductive success, and food habits of Red- and Black-legged Kittiwakes and Common and Thick-billed Murres. Sadie Wright also conducted research on breeding biology of Red-faced Cormorants (*Phalacrocorax urile*), a species known to be declining in some parts of its range. **Nikolai Konyukhov** studied activity patterns of Parakeet Auklets (*Aethia psittacula*) and molt patterns of Parakeet and Least Auklets on St. Paul.

Shiway Wang (UAF) made two trips to St. George Island in the Pribilofs (June and August) as part of the second year of sampling for her MS project. She is targeting fatty acid signature analysis in fat tissue and stomach oil of Northern Fulmars. **Scott Hatch** (USGS) assisted on both occasions.

Stress hormone levels and fatty acids in kittiwakes, auklets, and murres are being investigated at various sites on AMNWR in the Bering Sea, under a project funded by the North Pacific Research Council. Principal Investigators are **Alan Springer** and **Alexander Kitaysky** (UAF) and **Sara Iverson** (Dalhousie University). Samples were collected on St. George by **Michael Schultz** and **Tom Dempsey** of UAF. (See also the Aleutian Islands report below). Schultz is working on his MSc thesis, “The functional role of corticosterone release during food shortages in Black-legged Kittiwakes,” at the University of

REGIONAL REPORTS – Alaska

Alaska under Kitaysky. He has also worked during the last two years for Kitaysky, Springer, and Iverson on the Regime Forcing and Ecosystem Response in the Bering Sea Project (ReFER II), which has field sites at Buldir, St. Paul and St. George Islands.

Kim Nelson, of the Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University (OSU) started a new project on the documenting the cultural geography, biogeography, and traditional ecological knowledge of King Island, with **Deanna Kingston** and **Jesse Ford** (OSU). The research will include an inventory of the flora and fauna on and around King Island, learning ecological knowledge from the King Island Elders, and sharing scientific and social-scientific methods (interviewing, audio-visual recording, sampling, identification of plant and animal species, surveying archaeological sites, etc.). Researchers will work with elders and young King Islanders and will develop educational materials for children. The focus of Nelson's research will be on the seabirds and marine mammals; others will focus on the geology, archeology, botany, and place names. The team made a reconnaissance visit to the island in 2004; inventories and sharing of traditional and scientific knowledge will take place during 2005 and 2006.

Seabirds were monitored again on Round Island in the Walrus Islands State Game Sanctuary, Bristol Bay. **Mary Cody** of the U.S. Fish and Wildlife Service (USFWS), **Diane Calamar Okonek**, **Missy Helfrich**, **Todd Rinaldi** and **Marian Shively** (Alaska Department of Fish and Game), volunteer **Martin Schulz**, and Bristol Bay Native Association student interns **Alicia Active** and **Denise Coupchiak** recorded populations and productivity of Black-legged Kittiwakes, Common Murres, and Pelagic Cormorants.

Seabird monitoring took place on St. Lawrence Island for the 5th straight season. **David Irons** and **Kent Wohl** (USFWS), in cooperation with **Daniel Roby** of the USGS Cooperative Fish and Wildlife Research Unit, Oregon State

University (USGS–OSU), have been monitoring the seabirds with permission from the Gambell and Savoonga Native Corporations since Jun 2000. Field work was conducted by **Lisa Sheffield** and **Ian Rose** from 17 Jun through 4 Sep 2004. They were joined through 17 Aug by **Victor Zubakin**, senior researcher at A. N. Severtzov's Institute of Ecology and Evolution, Russian Academy of Sciences. They monitored population indices and productivity of Black-legged Kittiwakes, Common Murres, and Thick-billed Murres on previously established plots. Studies of Least and Crested (*Aethia cristatella*) Auklets included banding of adults and monitoring of productivity, diet composition, colony surface attendance, and chick-provisioning behavior. The auklet research will contribute to the Alaska Seabird Monitoring Database and will be used for Sheffield's MSc thesis. Nesting chronology and nesting success for all five species were within the range of the previous four years, but productivity was relatively high for the piscivorous species, apparently due to high availability of sand lance.

Togiak National Wildlife Refuge staff monitored the population and productivity of Black-legged Kittiwakes, Common Murres, and Pelagic Cormorants at Cape Peirce in 2004. The camp was opened on 27 April, and seabird monitoring occurred from early May to early September. In addition, predation and disturbances to seabirds were recorded. Staff at Togiak National Wildlife Refuge have monitored the shore-based plots at Cape Peirce annually since 1984. The average number of Black-legged Kittiwake adults and nests on all plots was below the 10-year average. However, each parameter was within the range recorded during the last 10 years. Overall productivity for Black-legged Kittiwakes high, well above the 10-year average, although within the range of values during that time. The average number of Common Murre adults on all plots was slightly below the 10-year average, but was within the range recorded during the last 10 years. Breeding per-

formance parameters for Common Murres were average, slightly below the 10-year mean, and within the 10-year range. The average number of Pelagic Cormorant adults and nests on all plots was low. Both nest numbers and breeding performance for this species were and slightly below the 10-year average.

Bob Day (ABR, INC.—Environmental Research and Services) studied movements and flight altitudes of migrating eiders (*Somateria spp.*) and other waterbirds near proposed wind farms at Hooper Bay and Mekoryuk (western Alaska) and at Fire Island (near Anchorage).

ALASKA NORTH SLOPE

Mike Knoche, MS student at UAF, collected primary feathers from 287 King Eiders (*Somateria spectabilis*) caught in the local subsistence harvest at Pt. Barrow, Alaska. He is working with **Abby Powell**, **Mat Wooller**, **Perry Barboza**, and **Lori Quakenbush** at UAF on the differences in stable isotope values of feathers due to location of molt (sources of C and N) and gender (temporal variation of molt or fractionation). They are also processing primary feather samples from satellite-transmitter King Eiders provided by **Laura Phillips** (UAF) that will yield dietary information from wing molt locations. Principal investigators were **Robert Suydam** (North Slope Borough Department of Wildlife) and Lori Quakenbush.

Biologists of ABR, Inc.—Environmental Research and Services continued numerous studies on the North Slope. **Bob Day** worked on eider migration and collision potential near Northstar Island, an artificial oil-production island offshore of Prudhoe Bay. **Betty Anderson** completed the 12th year of research on Spectacled and King eiders (*Somateria fischeri* and *S. spectabilis*) in the Kuparuk Oilfield of Northern Alaska. **Charles (Rick) Johnson** continued his long-term monitoring studies of Spectacled and King eiders on the North Slope of Alaska, on the Colville River Delta (13 years) and in the National Petroleum Reserve—Alaska (5 years). Study components for

REGIONAL REPORTS – Alaska

these multi-year projects included aerial surveys for breeding pairs, nest searches, determining nesting success, and inserting thermistored eggs in active nests of Spectacled Eiders to monitor nest attendance and predation. These studies were supported by ConocoPhillips, Inc. **Bob Ritchie** and **Jim King** completed their 6th year of aerial surveys for Steller's (*Polysticta stelleri*) and Spectacled eiders near Barrow, Alaska. Data also were collected for Long-tailed ducks (*Clangula hyemalis*) in 2004. This study was funded by the Bureau of Land Management and USFWS.

ALEUTIAN ISLANDS

Jeff Williams coordinated long-term seabird monitoring for AMNWR at Aiktak, Kasatochi, and Buldir Islands and other studies in the archipelago.

At Aiktak Island in the eastern Aleutians, **Denny Wynn** and **Debbie Dykstra** monitored timing of nesting events, reproductive success, food habits, and population size of Glaucous-winged Gulls (*Larus glaucescens*), Black Oystercatchers (*Haematopus bachmani*), Tufted Puffins (*Fratercula cirrhata*), Ancient Murrelets (*Synthliboramphus antiquus*), and Leach's and Fork-tailed Storm-Petrels (*Oceanodroma leucorhoa* and *O. furcata*).

Jeff Williams and Vernon Byrd assessed productivity for Black-legged and Red-legged Kittiwakes and determined population trends of Tufted Puffins at Bogoslof Island in the eastern Aleutians, and they mapped ledge-nesting seabird colonies at Chagulak Island.

There are 3 monitoring sites in the central Aleutians: Kasatochi, Ulak, and Koniugi Islands. On Kasatochi, **Brie Drummond** and **Saralyse Kissler** primarily studied Least and Crested Auklet productivity, chick growth, food habits, attendance patterns, populations and adult survival rates. They also mapped the auklet colony, using the new protocol that is being developed. Drummond and Kissler also monitored population levels of Pigeon Guillemots (*Cephus columba*), Pelagic and Red-faced Cormorants, and Leach's and Fork-tailed

Storm-Petrels. At nearby Ulak Island, populations and productivity of burrow-nesting seabirds were monitored, and cormorant and murre population levels were recorded. On Koniugi Island, kittiwake and murre populations were monitored.

John Piatt (USGS) and **Tony DeGange** (USFWS) conducted surveys for Kittlitz's and Marbled Murrelets (*Brachyramphus brevirostris* and *B. marmoratus*) around Atka Island in the central Aleutians.

Alan Springer (UAF) and **Sara Iverson** (Dalhousie University) collected samples at Kasatochi, Chagulak and Bogoslof Islands to look at stress-hormone levels and fatty acids in auklets, murres and kittiwakes at various sites. This project is funded by the North Pacific Research Council. **John Citta** and **Joe Seyfried** collected samples on Buldir Island. Principal investigators for this project are Springer, Iverson, and **Alexander Kitaysky** (UAF). (See also Pribilof Islands report, above).

In the Rat Islands group of the western Aleutians, **Vernon Byrd**, **Jeff Williams**, and **Ian Jones** and **Jacques Marias** of the Memorial University of Newfoundland (MUN) counted cormorants in July, repeating surveys that were conducted in the 1970s. Surprisingly, cormorant populations have increased substantially in this time period, in sharp contrast to the Near Island group to the west. **Jeremiah Trimble** (Harvard University) and **Peter Trimble** assisted with the cormorant surveys and also collected birds for an ongoing study of cormorant systematics. Ian Jones and Jacques Marias mapped the large auklet colony on Semisopochnoi Island during May through July.

At Buldir Island in the western Aleutians, technicians **Martin Murphy** and **Slade Sappora** conducted the 17th year of annual seabird monitoring. Species monitored included Red- and Black-legged Kittiwakes, Common and Thick-billed Murres, Least, Crested, Whiskered (*Aethia pygmaea*) and Parakeet (*A. psittacula*) Auklets, Pelagic and Red-faced Cormorants, and Leach's and Fork-

tailed Storm-Petrels. For most species, timing of nesting events, productivity, food habits and population levels were monitored.

INTRODUCED PREDATORS IN THE ALEUTIANS

A project to remove rats (*Rattus* spp.) from small islets near Adak to restore seabird populations was continued by AMNWR personnel **Peter Dunley**, **Lisa Scharf**, and others. **Greg Thomson** led another AMNWR project to removed introduced arctic foxes (*Alopex lagopus*) from Avatanak Island, and **Steve Ebbert** continued efforts to clear Adak and Tanaga Islands of introduced foxes.

On Kiska Island, **Johanne Dussureault** (MUN) and **Andrew Riche** monitored productivity and survival of Least and Crested Auklets for an ongoing study of the effect of rats (on auklet populations. They also mapped the large auklet colony using the new mapping protocol that is being developed. The Least Auklet population at Sirius Point experienced near failure of breeding during 2001 and 2002, when rat sign was abundant at the colony site. In 2003 and 2004, when rat sign was scarce, auklet productivity was similar to rat-free Buldir and Kasatochi Islands. No caches of rat-predated adult auklets were found in 2004. The results of four years of monitoring at Kiska are consistent with the idea that in some years introduced Norway rats cause auklet breeding failure at Kiska. Adult auklet survival rates were high (89% and 95%) in two years when rat sign was abundant and productivity was low, which suggests that rat predation does not reduce auklet annual survival significantly at Sirius Point.

More work is needed to assess the impacts of rats on the auklet breeding population at Sirius Point. Population viability analysis (PVA) should be employed to assess the likely impact of different frequencies of breeding failure on population trends. Preliminary modeling suggests that if the colony experiences failure similar to 2001 and 2002 in half or more of future years, it will decline to near extinction within 30 years. A quan-

REGIONAL REPORTS – Alaska

titative method for monitoring rat populations is required and should be implemented starting in 2005. Rat population ecology needs to be studied quantitatively at Kiska to ascertain the causes of the observed drastic inter-annual population fluctuations. Future rat control experiments using poison should employ a Before-After-Controlled-Impact experimental design. Foraging ecology of auklets at Sirius Point and nearby Buldir Island should be investigated more closely to evaluate the possibility that the auklets on Kiska are food-stressed. Additional years of monitoring of auklet productivity and survival and rat activity should be considered because both auklet and rat demography fluctuate. It is not too early to start making plans for the removal of introduced Norway rats from Kiska Island.

GULF OF ALASKA

In 2004, **Kathy Kuletz** (USFWS) initiated a three-year study of Kittlitz's (*Brachyramphus brevirostris*) and Marbled (*B. marmoratus*) Murrelets in Kachemak Bay, Alaska. The study will repeat historic surveys to track decadal changes in the population following large declines in the two *Brachyramphus* species at other locations. In addition, habitat use, changes in distribution and in juvenile numbers will be examined. The project was funded this year by USFWS–Ecological Services, and will receive funding over the next two years from Alaska Department of Fish and Game (ADF&G) as well as in-kind support from numerous non-federal groups. The 2004 effort was conducted primarily by **Karen Brenneman** and **Elizabeth Labunski**, with vessel and field support from AMNWR, in particular **Leslie Slater** and **Dave Roseneau**.

Heather Renner coordinated AMNWR's seabird monitoring in the Semidi Islands. **Ram Papish, Allyson Larned** and **Andy Ramey** lived on Chowiet Island in Jun-Aug, monitoring timing of nesting, reproductive success, food habits and populations size for Glaucous-winged Gulls, Black-legged Kittiwakes, Common and Thick-billed

Murres, and Rhinoceros Auklets (*Cerorhinca monocerata*). Heather Renner assisted for a week in July. Heather Renner, **Jeff Williams** (AMNWR), **Martin Renner** (MUN), **Martin Robards** and **Michelle St. Peters** conducted surveys of burrow-nesting seabirds on nearby Suklik Island

Don Dragoo, Heather Renner, Jeff Williams, **Anne Morkill** (AMNWR), Martin Renner, Martin Robards, Michelle St. Peters, **Brenda Holladay**, **Kitty Mecklenburg**, **Ken Gates** and **Jeff Anderson** conducted the Seabird, Marine Mammal, and Oceanography Coordinated Investigation (SMMOCI) project in the Semidis. This multi-year project involves transects near seabird colonies where simultaneous nest monitoring is being conducted, in order to evaluate the relationship of seabird foraging to breeding success.

Shiway Wang (UAF) conducted a second year of sampling for her MS project targeting fatty acid signature analysis in fat tissue and stomach oil of Northern Fulmars. Completion of the field work in 2004 entailed two trips to the Semidi Islands—in June, assisted by **Scott Hatch** (USGS) and **Naomi Bargmann** of the University of Alaska Anchorage (UAA), and in August, assisted by Hatch and **Andy Ramey**. She also made two trips to St. George Island in the Pribilofs (June and August, assisted by Scott Hatch on both occasions). Shiway was also able to round out her sampling of Alaska fulmars during a brief trip to the major colony on Chagulak Island (eastern Aleutians) in July. On that same trip, Scott Hatch and **Dan Mulcahy** (USGS) captured and implanted four fulmars with satellite transmitters as part of an ongoing investigation of winter movements in that species.

Greg Siekaniec (Manager, AMNWR) continued to work with local cattlemen to attempt to remove cows from Chirikof Island, as part of a program to restore the island for seabirds.

At East Amatuli Island in the Barren Islands, **Arthur Kettle**, **Valerie Steen**, **Wendy Fair** and **Marcy Okada** (AMNWR) monitored reproductive suc-

cess, prey, and population trends of Fork-tailed Storm-Petrels, Black-legged Kittiwakes, Common and Thick-billed Murres, and Tufted Puffins. Population data were also gathered for Glaucous-winged Gulls.

Leslie Slater checked monitoring plots for Tufted Puffins at Chiswell Island in Resurrection Bay, and she monitored Black-legged Kittiwake productivity at Chisik and Duck Islands in Cook Inlet.

Bob Day (ABR, INC. – Environmental Research and Services) began studies of the seasonal distribution and abundance of marine birds in lower Cook Inlet (Iliamna and Iniskin bays). He also studied movements and flight altitudes of migrating waterbirds near a proposed wind farm at Fire Island, near Anchorage.

The seabird component of the GAP (Gulf Apex Predator-prey) ecosystem research project is focussing on Black-legged Kittiwakes, Glaucous-winged Gulls, and Tufted Puffins in Chiniak Bay, Kodiak Island. The goal of GAP seabird research is to use these three species as bio-indicators of forage fish abundance within commuting distance of their breeding colonies in Chiniak Bay, Kodiak Island, and to relate seabird productivity and population trends to variations in climate, oceanography, and structure of the marine ecosystem in the Western Gulf of Alaska. University of Alaska researchers **Loren Buck**, **Dean Kildaw** and graduate students **Katie Murra**, **Brook Gamble** and **Cory Williams** completed a fourth field season on this project, supported by the tireless technical assistance of incoming graduate students **John Brewer** and **Rachael Orben**, along with **Travis Cooper**, **Sarah Runk**, and **Arielle Parker** (volunteer high school student).

Under the GAP umbrella, seabird research is integrated with synoptic investigations of oceanography, forage fish abundance and distribution (**Robert Foy**, UAF), and marine mammal diets and habitat use (**Kate Wynne**). In collaboration with **David Irons** and **Kent Wohl** (USFWS, Migratory Bird Management),

REGIONAL REPORTS – Alaska

GAP continued a program to document the at-sea distribution of marine birds, in addition to continuing long-term efforts of monitoring populations and productivity of cliff nesting seabirds in Chiniak Bay.

In addition to basic monitoring of seabirds, GAP researchers have broad research interests in varied aspects of seabird ecology. **Loren Buck**, in collaboration with **Katie O'Reilly** of the University of Portland, is investigating relationships between brood size, physiological indicators of stress, and siblicide of nestling Black-legged Kittiwakes. **Dean Kildaw** is studying meta-population dynamics of Black-legged Kittiwakes within Chiniak Bay and processes by which new colonies form and grow. **Katie Murra** is preparing her MS thesis on diets, parental attendance and reproductive ecology of Black-legged Kittiwakes. **Brook Gamble's** MS thesis research is focused on breeding biology and physiology (glucocorticoids, plasma lipids) of Glaucous-winged Gulls. **Cory Williams** finished his second year of PhD research on the diet, foraging ecology and reproductive biology of Tufted Puffins. **John Brewer** completed the first field season of his MS work on the hormonal correlates of brood reduction in Black-legged Kittiwakes.

Scott Hatch, Jessica Fischer, and Andy Ramey (USGS, Alaska) continued long-term research and monitoring on Middleton Island. They were assisted this year by five USGS volunteers (**Cheryl Calistro, Justine Sears, Aaron Keech, Abigail Meddings, and Antony Mould**) from the Lower 48 and Great Britain. Rejoining the effort in 2004 were **Etienne Danchin** and **Fabrice Helfenstein**, along with **Joel White** and **Elodie Vigneron** from the Université P. et M. Curie, Paris. **Brian Guzzetti** (UAF) and **Verena Gill** (USFWS) initiated a project on the ecology of Black Oystercatchers (*Haematopus bachmani*) on Middleton this year. Finally, **Alexander Kitaysky, Zhenya Kitaysky, and Morgan Benowitz-Fredericks** (UAF) visited Middleton for a week in August to sample Black-legged Kittiwakes.

wakes Common Murres, Rhinoceros Auklets, and Tufted Puffins as part of a larger assault on the field endocrinology of seabirds in Alaska.

A short-term field camp was established along the Pacific coast of the Becharof National Wildlife Refuge on the Alaska Peninsula. **Susan Savage** and **Kristin Sesser** estimated population size and breeding phenology of Common and Thick-billed Murres and Glaucous-winged Gulls. This year's objectives included determining whether this colony (most recently monitored in 2001–2003) was subject to seabird die-offs, which were reported elsewhere in the state. To this end, beach surveys were also conducted. The population surveys were all land-based and are being compared statistically to counts of 2001–2003. Our target dates were within the 2-week interval around mean hatch date. However, since we did not monitor breeding from its inception this year, other estimates of hatch date were used. We monitored 106 Common and Thick-billed Murre sites on 8 plots to obtain a rough estimate of hatching date. The average percent of sites hatched by the final count day was 25%. Therefore, our count window was too early to straddle the mean hatch date. Population data were selected from previous years to match this year's phenological window before making comparisons. The mean population count was 1959 ± 158 murres. This was the highest count of the 4 recent years of monitoring, but was not statistically different from 2003. We also counted Glaucous-winged Gulls on the main colony. The mean population count was 88 ± 10 . Red-faced cormorants had returned to the area referred to as plot 3 in 2001 and 2002, after being absent in 2003. In addition to monitoring seabird population and productivity, camp staff also conducted beach surveys and small mammal trapping, and recorded incidental bird and mammal sightings and plant phenology.

Ann Harding continued working as a research ecologist at Alaska Pacific University, in close collaboration with John Piatt at the Alaska Science Center (USGS). Ann's work in 2003 included

finishing a paper on colony attendance and population attendance of Horned Puffins (*Fratercula corniculata*), and working with AMNWR on designing a protocol for mapping auklet colonies. Ann continues working on Cook Inlet data with John Piatt, and is currently looking at Common Murre (*Uria aalge*) time budgets in relation to food availability. Ann also continued her work on Dovekies (*Alle alle*; Little Auks) in summer 2004, joining an expedition to east Greenland (see report on Arctic and Antarctic).

PRINCE WILLIAM SOUND

Bob Day and Stephen Murphy (ABR, INC. – Environmental Research and Services), continued post-spill impact and recovery studies of the *Exxon Valdez* oil spill on marine birds in Prince William Sound (PWS).

David Irons (USFWS Alaska), with the aid of **Kelsey Sullivan, Aly McKnight**, and several others, continued long-term monitoring of Black legged Kittiwake populations, productivity, diets, and survival in Prince William Sound. Sullivan and McKnight also came back for a fifth year to conduct studies at the Shoup Bay kittiwake colony in Prince William Sound. Sullivan is looking at the effect of adjacent productivity on the rate of movement of experienced breeders. Irons, with the aid of Sullivan, McKnight, and many others, repeated the boat-based survey of marine birds throughout Prince William Sound in March and July for the *Exxon Valdez* Oil Spill Trustee Council (EVOSTC). The EVOSTC also funded a study to examine oil ingestion by Pigeon Guillemots and Black Oystercatchers in PWS.

Kelsey Sullivan completed his MS at Rutgers University this year.

Shawn Stephensen (USFWS, Anchorage, and a Master's student at UAA) conducted a study from Jun to Aug to determine the correlation between presence and absence of Marbled and Kittlitz's Murrelet and the water-column characteristics of Harriman Fiord, Prince William Sound. **Karen Brenneman, Elizabeth Labunski, David Irons**,

REGIONAL REPORTS – Alaska

Martin Reedy, and other USFWS volunteers assisted with the project. Small-boat surveys were conducted weekly to determine distribution, abundance, and foraging locations of murrelets in Harriman Fiord. We measured electrical conductivity (salinity), temperature, pressure (depth), and backscattereance (turbidity) of the water column with a SBE-19 Seacat Profiler (CTD). Overall water column characteristics in the fiord were documented by systematically sampling 1x1 km blocks during spring and neap tides. For purposes of comparison, water column characteristics were also measured at Blackstone Bay, College Fiord, Columbia Glacier, Meares Glacier, and Passage Canal.

SOUTHEAST ALASKA

Leslie Slater (AMNWR) coordinated annual seabird monitoring at St. Lazaria Island. Slater and **Ingrid Harrald, Meg Duhr-Schultz** and **Anna Cocker** (AMNWR) monitored the timing of nesting events, reproductive success, prey and populations of Leach's and Fork-tailed Storm-Petrels, Pelagic Cormorants, Glaucous-winged Gulls, Pigeon Guillemots, Common and Thick-billed Murres, and Rhinoceros Auklets.

Kathy Kuletz is working with ADF&G to procure funding for a resurvey of murrelets in Southeast Alaska in summer 2005. The survey was previously conducted by USFWS in 1994, and since over half the world's Marbled Murrelets are in this area, it is important to know the population's status. In conjunction with this project, Kathy worked with **Matt Kirchhoff** (ADF&G, Juneau), who hopes to establish a murrelet monitoring and research program in Southeast Alaska. Kathy assisted **Michelle Kissling** (USFWS–Juneau) in planning surveys for Kittlitz's along the outer coast of Glacier Bay National Park and Yakutat Bay. **Elizabeth Labunski** joined that survey, which provided better data on murrelet use of this exposed, remote coastline.

SEABIRD BYCATCH

Numerous activities related to sea-

bird bycatch were funded in 2004 from a congressional addition to the USFWS budget:

1. A cooperative research agreement with the University of Washington Sea Grant Program (WSGP) to improve seabird distribution data in Alaska, by compiling point-count data from three sources: International Pacific Halibut Commission survey vessels, Alaska Department of Fish and Game survey vessels, and National Oceanic and Atmospheric Administration survey vessels.

2. A second cooperative research agreement with WSGP to observe and minimize interactions between seabirds and trawler gear (warp cables, net sonde cables and trawl nets).

3. A cooperative research agreement with the Alaska Marine Advisory Program for the design and implementation of tori lines (streamer lines) and davits for use on smaller (26-55-foot) longline vessels.

4. A cooperative grant agreement with the Pacific States Marine Fisheries Commission to construct and distribute tori lines for small longline vessels and to provide cost-share incentives for construction of davits for these vessels.

5. A contract with Frasier Research and Development to design a three-page set of laminated Alaska seabird identification placards for fishermen and fishery observers.

6. A contract with Fisheries Information Services to explore the feasibility of expanding the real-time seabird bycatch reporting mechanism from the freezer longliner section of the Alaska longline fleet to the Individual Fishing Quota sablefish fleet.

7. A contract with Southwest Fisheries Science Center to study albatross foraging distribution and food habits, based on squid beaks collected at colony sites.

8. A contract with World Wildlife Fund to work with Russian fisheries and associated groups to distribute prototype tori lines. They also will develop instructional materials and conduct outreach efforts, with the goal of convincing Russian fishermen that it is in their own best

economic interest to reduce bycatch of seabirds (which is largely unregulated in Russia).

Funding also was used for direct acquisition of integrated-weight mainline for use as a seabird bycatch deterrent in Alaskan and Russian longline fisheries.

USFWS (Anchorage Fish and Wildlife Field Office) funded startup costs for the North Pacific Albatross Working Group web site, NPAWG.org. The site is operable but is still under construction. **Elizabeth Labunski** continued her work on the "Seabird Observer Notes" database, which compiles observations from groundfish fisheries observers in Alaska. For the third year, the NOAA-Fisheries Observer Program will continue to send albatrosses and fulmar specimens that were caught in groundfish fisheries to the University of Alaska Museum (**Kevin Winker**), where they will be processed to obtain demographic information and tissue samples. **Kathy Kuletz** continues to work with the North Pacific Fisheries Management Council and their contractors; she provides information and reviews on seabird-related issues.

OTHER PROJECTS

The Short-tailed Albatross Recovery Team (START) met in Chiba, Japan on May 25–28, 2004. Recovery and reclassification criteria were developed for the Short-tailed Albatross under the U.S. Endangered Species Act. START also created a comprehensive list of recovery tasks and prioritized them. The draft recovery plan will be available for public comment in late 2004 or early 2005; this will be announced in the Federal Register and on appropriate list servers. Over \$700,000 earmarked for short-tailed albatross recovery was placed in an account at the National Fish and Wildlife Foundation for future recovery efforts.

In April 2004, **Kathy Kuletz** organized a workshop on Kittlitz's Murrelets in Anchorage. The two-day event was well attended by wildlife managers, researchers, and conservationists. It provided a framework of research recommendations, as well as an exchange of information and ideas from a variety of

REGIONAL REPORTS – Alaska

participants.

Dave Roseneau (AMNWR) coordinated collection of seabird eggs for the contaminants program of the long-term Seabird Tissue Archival and Monitoring Project (STAMP).

In August 2004, **Falk Huettmann** moved from the Canadian Prairies to UAF. There he started a tenure track Assistant Professor position, shared between the Institute of Arctic Biology and the Department of Biology and Wildlife. Falk and his students established the EWHALE (Ecological Wildlife, Habitat and Data Analysis of the Land- and Seascape) laboratory, where he completed his earlier work on habitat associations of nesting Marbled Murrelets in British Columbia, and where he continues working on winter surveys and global database issues. He continued work of the previous 6 years on coastal surveys and research in the Sea of Okhotsk, Russian Far East. Falk's GIS and database modeling (together with international collaborators) have taken exciting turns: the models now deal with habitats, species and populations of wildlife such as Marbled and Kittlitz's Murrelets, Short-tailed Albatross, Tufted Puffins, shorebirds, and other species in North America, Asia, Africa and world-wide.

cirrhata), Common Murres (*Uria aalge*), Pelagic Cormorants (*Phalacrocorax pelagicus*), and Glaucous-winged Gulls (*Larus glaucescens*). All species bred successfully at Triangle in 2004. Hipfner and **Laura MacFarlane-Tranquilla** (SFU) led a top-notch field crew consisting of **Brianna Newton, Glen Keddie, Dominique** ("Don't call me Guy") **Lafleur, Jim Tranquilla, Jennifer Greenwood, Samantha Franks, Laurie Savard, and Valerie Labrecque**. Our core program was supplemented by two research projects: **Jessica Beaubier**, a University of British Columbia MSc student, conducted research on the ecology of key forage fish species at Triangle Island, while **Bri-Anne Addison** completed a second season investigating relationships between parental condition, stress response, and breeding success of Rhinoceros Auklets. Lastly, **Moira Lemon** (CWS) visited Triangle Island to check permanent plots and assess population status of Cassin's Auklets, Rhinoceros Auklets, and Tufted Puffins.

CWS also put considerable effort into documenting responses of seabird populations to removal of introduced predators in Haida Gwaii/QCI in 2004. **Mark Hipfner, Tony Gaston** (CWS), **Iain Stenhouse** (Memorial University of Newfoundland), and **Sam Iverson** (SFU) visited the seabird colonies in Englefield Bay, on the west coast of the QCI archipelago, to assess responses to removal of raccoons in the mid-1990s. Unfortunately, they found nothing to suggest that Ancient Murrelet (*Synthliboramphus antiquus*), Cassin's Auklet, or Rhinoceros Auklet populations have recovered on the affected islands. In addition, **Heidi Regehr, Brianna Newton, Valerie Labrecque, and Jason Shafto** revisited Langara Island, where rats were removed in the mid-1990s. Results there suggested little recovery of Ancient Murrelets, but on the bright side, Cassin's Auklets appear to have recolonized the island.

In the Queen Charlotte Islands, **Tony Gaston** reports that the usual monitoring of Ancient Murrelets and other seabirds continued at East Limestone Island, Laskeek Bay, where **Sue Charest** and **Ceit-**

lynn Epners ran the Laskeek Bay Conservation Society (LBCS) camp, which is now in its 15th year. Unfortunately, the number of departing Ancient Murrelet chicks at East Limestone Island was lower than in recent years; furthermore, for the third year running, they heard few prospecting birds late in the season. It appears that recruitment to the colony has fallen, and we believe that this may reflect a regional trend. On the positive side, LBCS carried out extensive surveys of Black Oystercatchers (*Haematopus bachmani*) for the national Gwaii Haanas Park Reserve and banded a record number of chicks in the process.

Ken Morgan (CWS, Sidney, BC), with field assistance from **Mike Bentley**, continues monitoring the at-sea distribution of seabirds. Using ships of opportunity to collect data on seabirds and marine mammals, Morgan is collaborating with **Bill Sydeman, Peggy Yen, Chris Rintoul, and Patrick O'Hara** (all of PRBO) and **David Hyrenbach** (Duke University Marine Laboratory) to identify areas of importance to apex predators within the California Current System off the west coast of Vancouver Island. Morgan, Sydeman, Yen, Rintoul, and Hyrenbach continue collaborating with **Sonia Batten** (Sir Alister Hardy Foundation for Ocean Science), **David Welch** (Canadian Department of Fisheries and Oceans), and **Mike Henry** on the Continuous Plankton Recorder project. This involves concurrent monitoring of changes in oceanographic conditions, abundance and community structure of near-surface plankton, and the abundance and species composition of seabirds and marine mammals along the Great Circle shipping route. This 6500-km transect runs from BC to Japan via the Bering Sea.

Morgan continues to work with the North America Free Trade Act (NAFTA) Commission for Environmental Cooperation on their Marine Species of Common Conservation Concern Initiative, assisting with the development of trilateral conservation plans for seabirds, marine mammals and sea turtles. And lastly, Morgan is assisting other CWS staff (Michael Dunn) with an initiative

CANADA Compiled by Louise Blight

WESTERN CANADA

Mark Hipfner of the Centre for Wildlife Ecology (CWE), which is under Simon Fraser University (SFU) and the Canadian Wildlife Service (CWS), reports that summer 2004 marked the 11th year of operation of CWE's seabird research and monitoring program on Triangle Island, BC. We monitored breeding chronology and success, the rates and consequences of relaying, chick diets and growth, and adult trophic status in Cassin's Auklets (*Ptychoramphus aleuticus*) and Rhinoceros Auklets (*Cerorhinca monocerata*). We also monitored various breeding parameters in Tufted Puffins (*Fratercula*

REGIONAL REPORTS – Canada

to establish Canada's first Marine Wildlife Area around the Scott Islands off northwest Vancouver Island.

In 2004 **Beth MacCallum** (Bighorn Environmental Design) worked on the McLeod River Harlequin Duck (*Histrionicus histrionicus*) Study. The study is located in west central Alberta and has been continuing since 1985 at various levels of effort. In 1996 a detailed study was initiated with the purpose of documenting Harlequin Duck distribution, abundance and use of the McLeod River system. This information was used to develop a mitigation strategy and a long term monitoring program to track the response of Harlequin Ducks to the Cheviot Mine development. The detailed study was continued in 1997 and 1998, after which the study entered a monitoring phase. In 2004, in addition to monitoring activities, direct observation and radio-telemetry techniques were used to evaluate response of Harlequin Ducks to road construction.

Alan Burger of the University of Victoria (UVic) is continuing research on Marbled Murrelets (*Brachyramphus marmoratus*) and other seabirds, mainly on Vancouver Island, British Columbia (BC). In collaboration with **Cathy Conroy** and assistant **Fern Wager**, field work in 2004 focused on radar surveys for murrelets in southwestern Vancouver Island, to be analyzed in conjunction with landscape-level habitat parameters. Burger also worked with **Louise Waterhouse** (BC Ministry of Forests), **Nadine Parker** of Simon Fraser University (SFU), and **Jared Hobbs** and **Anne Hetherington** of the BC Ministry of Water, Land and Air Protection (MWLAP), to develop and apply aerial survey for nesting habitat of Marbled Murrelet techniques using low-flying helicopters. Aerial surveys were done in 2004 on western Vancouver Island, the Sunshine Coast, the BC North Coast, and in Haida Gwaii/Queen Charlotte Islands (QCI). Burger also took time off to work as a naturalist in the Antarctic for three months.

UVic graduate student **Rob Ronconi** is studying the spatial distribu-

tion of Marbled Murrelets and other alcids off southwest Vancouver Island. Rob is developing spatial models combining both terrestrial (nesting habitat) and marine (foraging habitat) measures. To explain these distributions, Rob's fieldwork in 2004, focused on fine-scale distribution of alcids (using a shore-mounted theodolite), behavioral observations, and inshore boat surveys. Ronconi was assisted by **Heather Milligan**.

Spencer Sealy (University of Manitoba) and **Harry Carter** (Richmond, BC) continued their work on vagrancy in alcids (see *Pacific Seabirds* 29:109, 2002 for more information). In addition, Sealy was in the field in 2003 and 2004 on St. Lawrence Island, Alaska, assisting for short periods with a study of diets and productivity of auklets (see regional report for Alaska).

Anne Harfenist and **Janet Gray** conducted Marbled Murrelet radar surveys of 21 watersheds in Haida Gwaii/QCI. These were the first radar surveys done in the archipelago. Partners on the project were the Canadian Wildlife Service; Parks Canada Agency; B.C. Ministry of Water, Land and Air Protection; B.C. Timber Sales; Husby Forest Products; J.S. Jones; Weyerhaeuser Ltd.; and the Haida Forest Guardians. Additional funding was provided by the South Moresby Forest Replacement Account and the Endangered Species Recovery Fund.

EASTERN CANADA

Karel Allard is in the final stages of his PhD work under the supervision of **Antony Diamond** (University of New Brunswick) and **H. Grant Gilchrist** (CWS). Allard is studying foraging strategies and tactics of an avian predator (the Herring Gull, *Larus argentatus*) breeding within a prey resource (a large colony of Common Eiders, *Somateria mollissima*). Fieldwork was undertaken at East Bay, Southampton Island, Nunavut, in Canada's Eastern Arctic.

Shoshanah Jacobs and **Kerry Woo**, later joined by **Tony Gaston** (CWS), visited Coats Island, Nunavut.

They carried out the normal annual monitoring and banding of Thick-billed Murres (*Uria lomvia*). In addition, they carried out experimental handicapping of breeding murres to determine how it affected the provisioning of nestlings. They also deployed time-depth recorders to examine changes in foraging behavior between incubation and chick-rearing. Gaston, along with **Keith Hobson** (CWS), **Tim Lash** and **Kyle Elliot**, visited Digges Island at the west end of Hudson Strait to monitor murre populations and look at nestling diets. As at Coats Island, the diet of chicks at Digges is now dominated by capelin (*Mallotus villosus*). This is a marked change from the 1980s, when arctic cod (*Boreogadus saida*) was the predominant fish.

BYCATCH, POLLUTION

Joanna Smith (Birdsmith Ecological Research) is entering her third year at the University of Washington (UW), working on a PhD with Julia Parrish. In Canada, Smith continues to work with **Ken Morgan** of the Canadian Wildlife Service (CWS) to explore trends and solutions in seabird bycatch in the BC longline fisheries. Of greatest concern is the number of Black-footed Albatross (*Phoebastria nigripes*) caught off the coast during the summer months in fisheries management areas near the shelf break. A salvaged bird program in BC recovered 13 albatrosses, which were necropsied at CWS with help from **Chris Thompson** (UW). Based on this and other new information, Smith and Francis Wiese (UW) continue to refine their model of the impacts of the Canadian fisheries on the Black-footed Albatross population. Over the next year, Smith and **Jake Fraser** (Fraser Research and Development) will create the third (their second) in a series of color-laminated seabird guides designed to educate fishers and fisheries observers about the species that are affected by longline and groundfish fisheries. The new guides will be used by the US Fish and Wildlife Service (USFWS) in Alaska, in conjunction with the original albatross guide that was produced by **Liz Mitchell**.

REGIONAL REPORTS – Canada

Ken Morgan (CWS, Sidney, BC) continues to work on assessing the extent of seabird bycatch in Canada's west coast commercial fisheries. With tremendous assistance from others (**Jo Smith, Chris Thompson, Hollie Walsh, Keith Hobson**), he has been determining the relative age, gender, condition, diet and provenance of Black-footed Albatrosses that were killed as bycatch in longline fisheries in BC.

Louise Blight (MWLAP) has been collaborating with **Laurie Convey** and **Linda Nichol** (Fisheries and Oceans Canada), **Stafford Reid** (MWLAP) and others to develop a response strategy for sea otter rescue and rehabilitation in the event of an oil spill in Canadian waters. This strategy will also increase BC's capacity to deal with oiled seabirds.

Ken Morgan continues working on issues pertaining to oil pollution. He is working with **Pat O'Hara** (Canadian Institute of Ocean Sciences and UVic) on assessing the level of fouling of seabirds from chronic oil pollution and its spatial and temporal variability. As part of this work, O'Hara and Morgan are taking part in a national project—the Integrated Satellite Targeting of Polluters (I-STOP), which makes use of a satellite (RadarSat) to identify illegal offshore discharges of oil from vessels. O'Hara is the local lead on the I-STOP project.

Francis Wiese has been working as a Research Associate at the University of Washington (UW) with **Julia Parrish** since October 2002. He also continues to be involved in seabird bycatch issues in the Canadian Pacific demersal longline fishery, working with **Joanna Smith**, and maintains other close Canadian contacts providing national and international advice concerning oiled seabirds to government agencies and non-governmental organizations.

COASTAL STUDIES

A study of Leach's Storm-Petrel (*Oceanodroma leucorhoa*) was initiated on Saddle Rock in summer 2004 by **Julie Thayer** (PRBO Conservation Science). Her research examined demography, breeding biology, diet, and mammalian predators, in collaboration with **Jan Hodder** (Oregon Institute of Marine Biology) and **Roy Lowe** of the U.S. Fish and Wildlife Service (USFWS), Oregon Coast National Wildlife Refuge. In conjunction with this project, **Michelle Schuiteman** is studying seasonal variation in the breeding season diet of Leach's Storm-petrel at Saddle Rock for a Master's Degree under Jan Hodder.

Nathalie Hamel is doing her PhD in the School of Aquatic and Fisheries Sciences at the University of Washington (UW) under **Julia Parrish**. She is studying the population impact of commercial gillnet fisheries bycatch on seabirds, specifically common murres (*Uria aalge*) from Tatoosh Island. She is currently analyzing data for the chapter in her dissertation that will assess vulnerability to bycatch, using an index of spatio-temporal overlap in the abundance and distribution of murres and gillnet fisheries. She is also a part-time teaching assistant in the fisheries and oceanography departments. During the summer, Hamel was field supervisor for the crew on Tatoosh Island, which added another year's data to our long-term monitoring of murre attendance, reproduction, provisioning, and predator-prey interactions.

David Nysewander, Joe Evenson, Bryan Murphie, and Tom Cyra are continuing monitoring studies associated with the marine bird component of the Puget Sound Ambient Monitoring Program (PSAMP), which is conducted through the Washington Department of Fish and Wildlife. The monitoring of summer breeding species occurs on an intermittent basis and did not occur this summer, but will it resume the next few years, depending upon the species of focus. The species selected for this purpose by our project are primarily pigeon guillemot, black oystercatcher, and all

cormorants. This monitoring complements work on national wildlife refuges, since significant numbers of these species nest outside federal refuges.

Winter surveys under PSAMP focused on two components: statewide low-level aerial surveys, and tracking scoters that winter in western Washington through satellite- and radiotelemetry. Low-level winter surveys of marine birds and waterfowl started in 1992 and cover selected parts of all inner marine waters of western Washington. These surveys were conducted again December 2003 and January 2004, and will also occur December 2004-January 2005. Maps of densities for selected species and other data products are now available for the 1992-2004 winters and the 1992-1999 summer surveys. These continue to be available mainly through the Wildlife Resources Data Section of Washington Department of Fish and Wildlife, Olympia, (**Shelly Snyder**, 360-902-2483). We continue to be concerned about the decline of many marine bird species monitored in this region over the last 25 years.

Multi-year studies of declining overwintering species in Washington's inner marine waters started in February 2003 and have continued with new funding sources. Declining species include scoters, loons, and grebes. The first two winters' fieldwork focused on White-winged Scotters (*Melanitta fusca*) and Surf Scotters (*Melanitta perspicillata*). Individuals were tracked from Washington to breeding grounds in the Northwest Territories and northern Alberta and Saskatchewan. Males returned to molt in marine waters of northwestern Washington within two months, while females usually returned by the end of September. Research was expanded in the second year of work (2004) to include VHF telemetry and concentrated on the two scoter species in three locations. This work is revealing many new insights into habits and characteristics of these wintering populations, including nocturnal concentrations and differences between components of each species' flyway population. This project is expected to continue at least two more years. Ques-

WASHINGTON AND OREGON

Compiled by **Katie O'Reilly**

REGIONAL REPORTS – Washington and Oregon

tions should be directed to either **Joe Evenson** (360-902-8137) or **Dave Nysewander** (360-902-8134).

Deborah Jaques (Crescent Coastal Research) and assistant **Carol O’Casey** completed another field season in a long-term study of the use of southwest Washington estuaries by non-breeding Brown Pelicans (*Pelecanus occidentalis*). In 2004, we examined seasonal abundance, nocturnal and diurnal roost habitat use, age-specific distribution, and activity patterns within Grays Harbor and Willapa Bay. Total numbers and prevalence of young birds in the estuaries were high, in contrast to 2003, and reflected the boom-and-bust dynamics at southern breeding colonies over the past two years. Peak pelican abundance in Grays Harbor occurred in August, when more than 3700 pelicans were counted; about 65% of the total were hatch-year birds. Night roost habitat was available in Willapa Bay in 2004 for the first time in several years, due to natural formation of a sand island near the mouth of the estuary. The study is being conducted in conjunction with the USFWS, Lacey office, and the Washington State Department of Transportation.

During 2004, 222 volunteers with COASST (Coastal Observation and Seabird Survey Team) completed nearly 1200 beached-bird surveys at 111 sites in Washington and Oregon. The most noteworthy event was a massive die-off of Northern Fulmars (*Fulmaris glacialis*) that extended south to California. Fulmars accounted for more than half of the 2696 carcasses identified, and over 90% appeared to be juveniles. More details on the year’s results can be found in COASST’s annual report at www.coasst.org. In addition, Science Coordinator **Todd Hass** is currently writing a new version of the program’s field guide, *Beached Birds*, for use in the North Atlantic.

MARBLED MURRELETS

Martin Raphael and Tom Bloxton continued studies on Marbled Murrelets (*Brachyramphus mar moratus*) in Puget Sound, the Strait of Juan de Fuca, and

Hood Canal. They are based at the Pacific Northwest (PNW) Research Station, U.S. Forest Service (USFS), in Olympia, Washington. This was the fifth year of long-term population monitoring of murrelets under the Northwest Forest Plan (NWFP), which involves various researchers throughout Washington, Oregon, and northern California. Raphael and Bloxton surveyed Recovery Zone (Puget Sound and the Strait of Juan de Fuca, from the San Juan Islands to Olympia) for murrelets and other seabirds and marine mammals. They also continued to collect baseline data on within-season and annual changes in distributions, densities, and productivity indices of murrelets in the San Juan Islands.

The first full season of capturing and radio-tagging murrelets at sea in the Strait of Juan de Fuca and Hood Canal yielded 27 tagged adults and resulted in the location of 3 nests in Olympic National Park. Objectives for this project include: locating nests to describe nesting habitat at multiple spatial scales, documenting survival and fecundity rates, documenting patterns of offshore movements, and evaluating genetic similarity between the Washington population and populations from neighboring states and provinces. **Zach Peery** (University of California, Berkeley), **Nadine Parker** (Simon Fraser University and Canadian Wildlife Service), and Josh Adams (U.S. Geological Survey, Moss Landing Marine Laboratories) assisted in training personnel on capture, tagging, and blood sampling methods.

In collaboration with **Brian Cooper** of ABR, Inc, we conducted an eighth year of radar sampling at 10 large drainages around the Olympic Peninsula. The goal is to correlate murrelet numbers with the distribution and landscape configuration of nesting habitat defined at a broad scale. Efforts this past year have focused on ratios of morning and evening counts as a potential index to breeding activity. We also evaluated detectability of radar targets as a function of distance from the radar unit.

Work continues on developing a map of potential murrelet nesting habi-

tat in Washington, Oregon, and California as part of the collaborative mapping effort under the NWFP. Drafts of this map were derived from a regionwide, satellite-based vegetation map that the USFS and Bureau of Land Management are developing in support of monitoring efforts throughout the Pacific Northwest. A parallel modeling effort is centered on ground-based vegetation sampling at “occupied” and “absence” sites, as identified from previous surveys using the PSG Inland Survey Protocol in western Washington. This regional effort is in collaboration with **Mark Huff** and **Rich Young** of the NWFP Interagency Monitoring Program, **Sherri Miller** and **Jim Baldwin** of the Pacific Southwest (PSW) Research Station, **Kim Nelson** (Oregon Cooperative Fish and Wildlife Research Unit, OSU), and **Beth Galleher** of the PNW Research Station, with the cooperation of Washington Department of Natural Resources (WDNR), National Park Service, Rayonier Timber Lands, and WDFW.

The Oregon Department of Forestry contracted with Turnstone Environmental to conduct surveys on state lands in the Coast Range of Oregon. The surveyors visited a mixture of first-, second-, and multi-year sites, and they conducted over 1250 surveys at 170 unique sites and 680 unique stations. Murrelets were present during 82 surveys, and “occupied” behavior was observed during 13 surveys.

Turnstone Environmental completed the last year of a Marbled Murrelet project for the Mount Baker-Snoqualmie National Forest. Forty visits were conducted in each of two years. No Marbled Murrelets detected.

Turnstone Environmental also initiated a 2-year contract to survey Marbled Murrelets for WDNR’s Northwest Region. The project included extensive pre-season Marbled Murrelet habitat delineation and the survey of 63 first-year sites via 346 surveys. Two previously initiated sites were also completed. Marbled Murrelets were present at 11 sites, and surveyors recorded “occupied” behavior at 4 sites. All of Turnstone

REGIONAL REPORTS – Washington and Oregon

Environmental's surveys were conducted according the PSG's 2004 protocol requirements.

As part of the Northwest Forest Plan Effectiveness Monitoring Program, **Craig Strong** of Crescent Coastal Research continued monitoring Marbled Murrelet populations in Oregon and northern California. Population estimates for Oregon have been relatively steady since 2000; however, this season's estimates have yet to be completed.

Mark Huff reports that the Marbled Murrelet Effectiveness Monitoring Team has submitted a draft report for peer review entitled "Northwest Forest Plan—The First 10 Years (1994-2003): Status and Trend of Populations and Nesting Habitat for the Marbled Murrelet." The Northwest Forest Plan region covers Washington, Oregon, and northern California. The report will be published as a Pacific Northwest Research Station General Technical Report; it is scheduled for electronic distribution in late winter 2005. Of the 5 chapters in the report, the first two provide context and background information; subsequent chapters present population and habitat monitoring results. Chapters in the draft report are as follows:

1. Introduction to Northwest Forest Plan effectiveness monitoring of the Marbled Murrelet. By Mark H. Huff.
2. Review of Marbled Murrelet biology: habitat relations and populations. By S. Kim Nelson, Mark H. Huff, Sherri L. Miller, and Martin G. Raphael.
3. At-sea monitoring of Marbled Murrelet population status and trend in the Northwest Forest Plan area. By Sherri L. Miller, C. John Ralph, Martin G. Raphael, Craig Strong, Chris Thompson, Jim Baldwin, and Mark H. Huff.
4. Estimating the amount of Marbled Murrelet nesting habitat using a systematic grid sampling strategy. By Mark Huff, Martin Raphael, Sherri Miller, Kim Nelson, Jim Baldwin, Richard Young, Martin Brown, and Diane Evans-Mack.
5. Spatially-Explicit Estimates of Potential Nesting Habitat for the Marbled

Murrelet. By Martin G. Raphael, Beth Galleher, Mark Huff, Sherri Miller, Kim Nelson, and Richard Young.

COLUMBIA RIVER

Dan Roby of Oregon State University (OSU) and his cooperators continued research on predation by seabirds on salmon smolts in the lower Columbia River. They monitored colony parameters and diets of Caspian Terns and Double-crested Cormorants (*Phalacrocorax auritus*) in the Columbia River estuary, and at the Caspian Tern colony on Crescent Island the confluence of the Snake and Columbia rivers. They also studied Caspian Tern colony status and diet composition at other colonies on the coast of Washington; this information will be used in the development of a Caspian Tern Management Plan and Final Environmental Impact Statement (EIS). For more information, see two reports in this issue of *Pacific Seabirds*.

Francis Wiese has been working as a Research Associate at UW with **Julia Parrish** since October 2002. He is overseeing the "Avian Predation" project, which aims to quantify the impacts of avian predators on endangered salmonid (*Oncorhynchus* spp) stocks in the mid-Columbia River. Predators being investigated include California Gulls (*Larus californicus*), Ring-billed Gulls (*L. delawarensis*), Caspian Terns (*Sterna caspia*), Double-crested Cormorants (*Phalacrocorax auritus*), and Common Mergansers (*Mergus merganser*). Wiese is currently involved in creating an adaptive management framework to deal with these predator-prey linkages, taking a broad ecosystem approach, and has built new bioenergetics models to assess these linkages.

Joanna Smith continues a PhD at UW with Julia Parrish. She is interested in the foraging ecology of birds and how their distribution is influenced by characteristics of oceanic or freshwater habitats. Her PhD project focuses on the Common Merganser on the mid-Columbia River in Washington and the Juan Fernández Petrel (*Pterodroma externa*)

in Chile. She is analyzing factors that cause temporal shifts in foraging behavior and habitat use, with a special interest in the chick-rearing period. These two case studies will provide useful insights into how two fish-eating birds, with disparate breeding strategies, use complex, unpredictable or highly fragmented habitats to provision themselves and their chicks. Both studies have direct conservation applications—for a hydroelectric project on the Columbia River and for the protection of an endemic seabird on the Juan Fernández Islands, Chile.

Heather Ziel is working on the Avian Predation project at UW. She is managing the reference fish collection for the project, and she spent the summer supervising summer field technicians while collecting specimens. Ziel came to Washington from Maine where she completed an MS on the American Woodcock (*Scolopax minor*) and subsequently worked for several years on restoring a colony of Common and Roseate Terns (*Sterna hirundo* and *S. dougallii*).

PELAGIC STUDIES

Rob Suryan continued work with **Dan Roby** in the Oregon Cooperative Fish and Wildlife Research Unit (OSU) on satellite telemetry of Short-tailed Albatrosses (*Phoebastria albatrus*; STAL). The STAL telemetry project experienced a hiatus in data collection in 2004 but will resume in 2005. We also hope to begin tracking efforts during the 2005-06 breeding season. Collaborators are the Japanese Ministry of Environment (**Shihoh Kanie**), USFWS (**Greg Balogh**), and the Yamashina Institute for Ornithology (**Fumio Sato**, **Kyoaki Ozaki**). Additional participants in this study include **David Hyrenbach** (Duke University) and **Paul Sievert** (University of Massachusetts, U.S. Geological Survey). Recent efforts have focused on analysis of marine habitat use, in collaboration with **Kim Dietrich** and **Ed Melvin** (UW and Washington Sea Grant) to obtain data on the distribution of fisheries and fishing effort for comparison with STAL distribution. We also worked hard

REGIONAL REPORTS – Washington and Oregon

in 2004 on international meetings and conferences to promote collaborative efforts in the at-sea conservation of STAL. Such efforts included contributing data and participating in Birdlife International's global Procellariiform tracking database (final report available soon). The goal of this project is to identify globally important pelagic habitat (in effect, extending the concept of "Important Bird Areas" offshore), and overlap with respective fisheries management organizations. Suryan is also collaborating with **David Anderson** (Wake Forest University), and **Scott Shaffer** and **Yann Tremblay** (University of California, Santa Cruz) to investigate inter-species comparisons of albatross morphometrics and foraging environments in the Central and North Pacific.

OTHER WORK

Kim Nelson, Dan Roby, and Adrian Gall (Oregon Cooperative Fish and Wildlife Research Unit, OSU), are developing a seabird monitoring strategies and techniques manual for USFWS biologists and managers within the California Current System (CCS), with the help of many seabird biologists on the west coast. This manual will contain science-based, standardized protocols for collecting data that will allow assessment of population status and trends for seabirds nesting in the CCS. The manual will include: (1) a comprehensive strategy for determining status and trends; (2) identification of focal seabird species, with the rationale for their selection; (3) identification and rationale for population parameters to be monitored; (4) identification and rationale for monitoring sites; (5) detailed, standardized protocols for data collection, analysis, and reporting; and (6) discussion of the statistical and biological objectives, assumptions, weaknesses, and limitations of the proposed monitoring protocols. Nelson also started a new project on documenting the cultural geography, biogeography, and traditional ecological knowledge of King

Island, in the Bering Sea, Alaska. (See details in the regional report for Alaska).

Kim Nelson started a new project on documenting the cultural geography, biogeography, and traditional ecological knowledge of King Island, in the Bering Sea, Alaska (see report for the Alaska).

Anne Mary Myers is continuing her MS. program under the supervision of **Dan Roby** (Oregon Cooperative Fish and Wildlife Research Unit, OSU). She is evaluating Quantitative Fatty Acid Signature Analysis as a method to determine diet composition in piscivorous seabirds, using captive rearing experiments with Caspian Terns.

Strong is also studying nesting success in Caspian and Forster's terns in the San Francisco Bay. The overall number of chicks/nest produced was low relative to other sites in North America, especially for Caspian terns. South San Francisco Bay colonies exhibited the lowest nesting success, probably due to water level fluctuations, predation, gull encroachment, and contamination levels.

Seabirds on Alcatraz Island, San Francisco Bay, continue to be monitored in relation to prey availability in the central bay. **David Gardner, Julie Thayer, and Bill Sydeman** of PRBO Conservation Science (PRBO), in association with **Bill Merkle** (Golden Gate National Recreation Area), recorded population dynamics, breeding performance, and diet of Brandt's Cormorants, Pelagic Cormorants, Western Gulls, and Pigeon Guillemots. **Jason Yakich** (San Francisco State University) is a collaborator on this project, examining variability in Brandt's Cormorant diet for his Master's thesis.

Meredith Elliott, Jennifer Roth, Christine Abraham, and Bill Sydeman continued a study of Least Tern (*Sterna antillarum brownii*) foraging ecology at Alameda Point, San Francisco Bay. They conducted on-colony observations in order to estimate nestling feeding frequency. In addition, they collected dropped fish and chick fecal samples in order to assess chick diet. Results will be combined with other data to assess the effect of prey availability on nestling feeding frequency and chick diet and how those factors may influence reproductive success. Cooperators on the project include **Rachel Hurt and Chris Bandy** of the U.S. Fish and Wildlife Service (USFWS), **Eric Joliffe** (U.S. Army Corps of Engineers), **Andy Jahn** (Port of Oakland), and **Ann Zoidis** (Tetra Tech).

Long-term monitoring of 12 species of seabirds on Southeast Farallon Island (SEFI) continued for the 35th season.

NORTHERN CALIFORNIA

Compiled by **Esther Burkett**

COASTAL STUDIES

Cheryl M. Strong of the San Francisco Bay Bird Observatory has been the project coordinator for an analysis of two decades of data collected on Forster's Tern (*Sterna forsteri*), Caspian Tern (*Sterna caspia*), and California Gull (*Larus californicus*) colonies in San Francisco Bay: 1982-2003. **Larry Spear** with H.T. Harvey and Associates is a collaborator. Numbers of Forster's Terns declined significantly during the study, numbers of California Gulls increased, and numbers of Caspian Terns were stable. Flat, minimally vegetated islands, which are limited in the estuary, are critical for maintaining nesting larids. The planned restoration of the salt ponds of the San Francisco Bay estuary will likely remove some of these islands and levees. We recommend that restoration plans include the creation of islands to provide nesting habitat, since severe habitat limitation would lead to competition for nesting space and likely exclusion of the terns by the gull.

REGIONAL REPORTS – Northern California

Monitoring was supervised by **Russell Bradley, Pete Warzybok, and Bill Sydeman** (PRBO), in collaboration with **Joelle Buffa** (USFWS), San Francisco Bay National Wildlife Refuge Complex. Species monitored are Ashy-Storm Petrel (*Oceanodroma homochroa*), Leach's Storm-Petrel (*O. leucorhoa*), Double-crested Cormorant (*Phalacrocorax auritus*), Brandt's Cormorant (*P. penicillatus*), Pelagic Cormorant (*P. pelagicus*), Western Gull (*Larus occidentalis*), Black Oystercatcher (*Haematopus bachmani*), Tufted Puffin (*Fratercula cirrhata*), Rhinoceros Auklet (*Cerorhinca monocerata*), Cassin's Auklet (*Ptychoramphus aleuticus*), Common Murre (*Uria aalge*), and Pigeon Guillemot (*Cephus columba*). 2004 was a good reproductive year for most species; population numbers for almost all species, especially Common Murres and Brandt's Cormorants, increased dramatically.

Derek Lee, Bill Sydeman, and Nadav Nur (PRBO) are completing a long-term analysis on age, sex, and annual variation in demographic parameters of Cassin's Auklet from SEFI. Several PRBO staff are currently preparing presentations relating seabird diet, productivity, and life history to climate change for the 13th annual meeting of the North Pacific Marine Science Organization (PICES).

Monitoring of murre productivity was continued at the Castle Rocks colony, Monterey County (1996-2004). Disturbance and predation by Common Ravens (*Corvus corax*) throughout the breeding season, combined with disturbance by a single immature Brown Pelican (*Pelecanus occidentalis californicus*) during the chick period, led to almost total breeding failure at this colony.

Annual aerial photographic surveys of murre, Brandt's (*Phalacrocorax penicillatus*) and Double-crested Cormorant (*P. auritus*) colonies in northern and central California were continued in co-operation with California Dept. of Fish and Game (CDFG), with assistance from **Paul Kelly** (CDFG) and **Phil Capitolo**

of Humboldt State University (HSU).

David Gardner, Julie Thayer, and Bill Sydeman (PRBO), in association with **Gary Strachan** (California State Parks Bay Area District) continued long-term studies of demography and diet of seabirds on Año Nuevo Island. Species included Brandt's Cormorants, Pelagic Cormorants, Western Gulls, Rhinoceros Auklets, Cassin's Auklets, and Pigeon Guillemots. Efforts to restore native vegetation to benefit burrow-nesting alcids have been successful. This project began last year with collaborator **Michelle Hester** (Oikonos Ecosystem Knowledge). Almost half the habitat was planted and stabilized with material to reduce erosion in 2003; work on the remaining habitat will be completed in November 2004. Studies to determine the response of seabird populations to habitat changes are planned through 2010. Large population increases for most species on Año Nuevo Island (and Alcatraz Island) in 2004 were similar to those observed on SEFI. Other collaborators include **Dave Sands** (Go Native) and **Pat Morris** (University of California Natural Reserve System). Support was provided by Año Nuevo State Reserve and the State Coastal Conservancy.

Jim Harvey and **Hannah Nevins** at Moss Landing Marine Laboratories (MLML) and volunteers from the Monterey Bay National Marine Sanctuary continued a seventh year of Coastal Ocean Marine Bird and Mammal Education & Research Surveys (COMBERS). COMBERS and collaborators Jack Ames and others at CDFG's Marine Wildlife Veterinary Care and Research Center, Santa Cruz, documented the die-off of emaciated first-year Northern Fulmar (*Fulmarus glacialis*) in 2003 and 2004. Investigation of this event was coordinated with beach survey programs along the west coast of North America, including **Jan Roletto, Jamie Hall, and Joe Mortenson**, Beach Walk (Gulf of the Farallones National Marine Sanctuary), **Todd Hass** of the Coastal Observation and Seabird Survey Team (COASST), University of Washington, and **Scott Hatch** of the U.S. Geological Survey

(USGS), Alaska Science Center.

The Common Murre (*Uria aalge*) Restoration Project (CMRP) continued the ninth field season (1996-2004) of social attraction and monitoring efforts at nearshore central California murre colonies. The CMRP is a cooperative project of the U.S. Fish and Wildlife Service-San Francisco Bay National Wildlife Refuge Complex (USFWS), HSU, and National Audubon Society (NAS). Field work and other tasks in 2004 were conducted by **Gerry McChesney** (USFWS), **Rick Golightly**, **Nathan Jones**, **Karen Vickers**, **Travis Poitras**, **Lisa Eigner**, **April Robinson**, and **Josh Koepke** (all HSU), **Harry Carter**, **Mike Parker** (USFWS), and **Steve Kress** (NAS). Social attraction continued at Devil's Slide Rock (DSR; since 1996) and San Pedro Rock (SPR; since 1998), in San Mateo County. We recorded 190 breeding pairs of murres on DSR, a 73% increase from 2003 and nearly double the ten-year goal of 100 pairs. Similar to other years, murres attended SPR sporadically but no breeding occurred and social attraction equipment was removed at the end of the season.

MARBLED MURRELETS

C. John Ralph, Sherri Miller, Linda Long (U.S. Forest Service, Redwood Sciences Laboratory [RSL]), **Gary Falxa** (USFWS, Arcata), and **Craig Strong** (Crescent Coastal Research) continued offshore population surveys for Marbled Murrelets (*Brachyramphus marmoratus*). They worked in the Zone 4 conservation zone (Coos Bay, Oregon to Shelter Cove, California) from May through July. This is the fifth year using the protocol developed for monitoring by the Effectiveness Monitoring Team. Surveys of murrelet productivity (adult:juvenile ratios) were also completed in northern California during August; these surveys have been conducted since 1993. The USFWS crew of **Pat McNeil, Stacy Hintz, and Wendy Mellberg**, and the RSL crew of **Elias Elias, Morgan Strachan, Andrea McManus, and Brian O'Donnell** contributed much to the success of these ef-

REGIONAL REPORTS – Northern California

forts.

C. John Ralph, Sherri Miller, and Pablo Herrera (RSL) conducted inland Marbled Murrelet surveys in and near a recent burn in southern Humboldt County, California. The Canoe Fire occurred in 2003 along the southern edge of Humboldt Redwoods State Park, where RSL conducted research on murrelets from 1989 to 1993. Stations that occurred within the fire study area were re-surveyed for murrelets, in conjunction with Spotted Owl (*Strix occidentalis*) surveys and point count censuses for land birds. There were murrelet detections at some stations within the burned area.

As part of the Northwest Forest Plan Effectiveness Monitoring Program, **Craig Strong** of Crescent Coastal Research continued monitoring Marbled Murrelet populations in northern California for CDFG and USFWS. Of note were relatively more murrelets along the Sonoma County coast than in past years, including fledglings at sea off the mouths of the Gualala and Russian rivers.

David Bigger, Marbled Murrelet Monitoring Coordinator for The Pacific Lumber Company (PALCO) in Scotia, California continues to work as principal coordinator or collaborator on several projects. PALCO funds research on Marbled Murrelets to improve understanding of their biology. Since the PALCO Habitat Conservation Plan (HCP) was signed in 1999, the company continues to monitor nesting habitat in the Marbled Murrelet Conservation Areas of the HCP, Headwaters Forest Reserve, and Humboldt Redwoods State Park. PALCO also supports research projects through the Marbled Murrelet Research Fund. Some projects that were funded over the last 2-3 years include: (1) Power to Detect Trends in Marbled Murrelet Populations Using Audio-Visual and Radar Surveys; (2) Efficacy of Audio-Visual and Radar Surveys for Studying Marbled Murrelets in Inland Habitats; (3) Investigating the Effects of Stand and Landscape Characteristics on Occupancy and Detectability of Marbled Murrelets in Managed Forests; (4) The

PALCO Habitat Conservation Plan: Marbled Murrelet Inland Monitoring; (5) Continuation of a Study to Determine Population Trends of Marbled Murrelets in the Portion of Conservation Zone Four, North of the PALCO HCP Area; and (6) Conservation Genetics of Marbled Murrelets in Northern California. Numerous principal investigators and collaborators are involved in these studies.

AT-SEA STUDIES

Peggy Yen, Chris Rintoul, Patrick O’Hara, and Bill Sydeman (PRBO), with **David Hyrenbach** (Duke University Marine Lab), continue their investigations into at-sea habitat associations for marine birds (see Southern California and Canada sections). **Jaime Jahncke** has recently joined this research group at PRBO. Jahncke, Sydeman, and **Ben Saenz** (also of PRBO), and have initiated new studies investigating the seasonal and annual variability in upper trophic predator and prey distribution in the Gulf of the Farallones, to examine the design and effectiveness of Marine Protected Areas.

Breck Tyler, Jeff Davis, Laird Henkel, Brad Keitt, Tonya Haff, and Glenn Ford of the University of California at Santa Cruz are continuing to conduct aerial surveys of marine birds and mammals in California continental shelf waters, under contract with California Department of Fish and Game’s Office of Spill Prevention and Response. The surveys are designed to collect baseline distribution and abundance data and to maintain rapid-response capabilities for oil spills in coastal waters. During the past year, the team has primarily conducted surveys in the Monterey Bay region.

Jim Harvey (MLML) and **Josh Adams** (MLML, and USGS’s Western Ecological Research Center [WERC], Vallejo, California), with collaborators **David Hyrenbach** (Duke University) and **Cheryl Baduini** (Claremont Colleges), are using satellite telemetry to track the trans-Pacific migration of Sooty Shearwaters (*Puffinus griseus*) from central California to their nesting colonies

in the southern hemisphere. Daily updated data and maps are available to the public via the web (www.seaturtle.org/tracking/ and www.signalsofspring.net).

As part of the USGS Park Oriented Biological Support program, **Josh Adams** and **John Takekawa** (USGS-WERC, San Francisco Bay Estuary Field Station) are working with **Paige Martin** and **Kate Faulkner** (Channel Islands National Park) on foraging and population studies of Ashy Storm-petrels (*Oceanodroma homochroa*) in the park. This team completed the first of two seasons of aerial radio telemetry surveys (supported in part by **S. Schwartz**, U.S. Navy); this is the first distribution study of its kind involving storm-petrels.

Michelle Hester (Oikonos) reports that a collaborative group is investigating the post-breeding movements of Black-footed Albatross (*Phoebastria nigripes*) tagged in Cordell Bank National Marine Sanctuary (CBNMS) and integrating this research into a standards-based education program for middle-school students. The project will run from 2004 through 2006. Collaborators include Hester, **David Hyrenbach** (Duke University), **Carol Keiper** and **Hannah Nevins** (Oikonos Ecosystem Knowledge), **Josh Adams** (USGS), **Cheryl Baduini** (Claremont Colleges), **Jennifer Stock** (CBNMS), and **Glen Schuster** (Signals of Spring).

OTHER WORK

The completed first draft of the California Current System Marine Bird Conservation Plan, coordinated by **Brenna Langabeer** and **Kyra Mills** (PRBO), is now out for review. This is a comprehensive seabird conservation plan for all species of the California Current region, from Baja California to Alaska.

Publications from PRBO during 2004 include: “Ocean climate, euphausiids, and auklet nesting: inter-annual trends and variation in phenology, diet, and growth of a planktivorous seabird, *Ptychoramphus aleuticus*” by Abraham and Sydeman, in *Marine Ecology Progress Series* 274: 235-250; “Rockfish response to low-frequency ocean climate

REGIONAL REPORTS – Northern California

change as revealed by the diet of a marine bird over multiple time scales" by Miller and Sydeman, in press, *Marine Ecology Progress Series*; and "Marine bird community structure across the Eastern Gulf of Alaska: temporal variability and ocean habitat associations" by Yen, Sydeman, Morgan, and Whitney, in press, *Deep Sea Research II*.

A summary report on surveys and studies of seabirds and marine mammals off southern California (1999-2002) will be available in the near future. These studies were led by scientists working for the U.S. Geological Survey and Humboldt State University and cooperators with the Minerals Management Service, CDFG, USFWS, U.S. National Park Service, U.S. Navy, Oiled Wildlife Care Network, Channel Islands National Marine Sanctuary, and MLML. For information on obtaining the report, contact **John Takekawa** or **Josh Ackerman** (USGS-WERC).

Esther Burkett (CDFG) completed the final regulatory steps needed to list the Xantus's Murrelet (*Synthliboramphus hypoleucus*) as a threatened species under the California Endangered Species Act. The status report can be found at this web address: http://www.dfg.ca.gov/hcpb/species/t_e_s_p_p_t_e_b_i_r_d/x_a_n_t_u_s/xamu_stat_revu.shtml (Also see the Conservation Report in *Pacific Seabirds* 31(1), 2004.)

PSG, the Natural Resources Defense Council, and other interested parties are currently working with the Commission to secure protection for Xantus's Murrelets from bright lights associated with the market squid fishery in the Channel Islands. PSG and others assumed the issue would be covered with adoption of the preferred alternative in CDFG's Market Squid Fishery Management Plan, but the Commission did not choose that alternative. (See the Conservation Report in this issue.)

Michelle Antolos is beginning work at the University of California Santa Cruz on the foraging ecology of albatrosses on Tern Island, French Frigate Shoals, Northwest Hawaiian Territories. For more information see the Hawai'i and Pacific Rim report.

BAJA CALIFORNIA

Research on baseline health and contaminant parameters for Gulf of California seabirds (and other wildlife) has been initiated. Project coordinators include **Dan Anderson** (University of California at Davis), and **Scott Newman** and **Alonso Aguirre** of the Wildlife Trust. Collaborators include a group of Mexican scientists from the University of Mexico, the Mexican Secretariat of the Environment and Natural Resources, and the Mexican National Institute of Ecology: **Carlos Godinez, Karina Santos, Elvia de la Cruz, Alberto Paras, Oswaldo Martinez, Analilia Sandoval, Hector Hernandez, and David Ramirez**.

The project involves Brown Pelicans (*Pelecanus occidentalis*), Heermann's Gulls (*Larus heermanni*), and Yellow-footed Gulls (*Larus livens*), but also includes marine mammals and marine turtles.

This year was the first of three years for disease screening and contaminant sampling for the seabirds. Results indicate that residues of persistent organic pollutants continue to be very low. Analyses for elements in growing feathers are not yet complete, but it appears that although contaminants are low, certain colonies of Brown Pelicans are characterized by local biogeographic patterns of certain elements.

NON-PACIFIC UNITED STATES

Compiled by **Malcolm Coulter**

For the past 28 years **Joanna Burger, Fred Lesser, and Mike Gochfeld** (see below for affiliations) have been monitoring colony dynamics and reproductive success in colonial birds nesting on salt marsh island in Barnegat Bay along the New Jersey shore. In 2004 several trends were clear:

1. Common Terns (*Sterna hirundo*) experienced almost the worst year in

terms of reproductive success they have ever had. In the previous year when reproductive success was nearly zero for over a dozen colonies, which was a result of storms and excessive high tides washing over the salt marsh islands. In that same year, Black Skimmers (*Rynchops niger*) also suffered zero reproductive success. This year, parents deserted chicks and many chicks died from apparent starvation, perhaps brought on by a lack of the predatory fish that normally force prey fish to the surface where terns can feed on them.

2. Black Skimmers, on the other hand, had very high reproductive success, raising more than one young per pair. In New Jersey the Black Skimmers feed largely in the salt marsh creeks, and not in the main estuary and nearby Atlantic Ocean as do the terns.

3. As usual, one pair of Gull-billed Terns (*Sterna nilotica*) and one pair of Caspian Terns (*Sterna caspia*) nested on the salt marsh islands, but only the Caspians fledged a chick.

4. Most Herring Gulls (*Larus argentatus*) also failed to raise any young, and they were raised from only one of about 12 colonies.

Affiliations of the Barnegat Bay researchers: Joanna Burger is at Rutgers University (RU), Environmental and Occupational Health Sciences Institute, Consortium for Risk Evaluation with Stakeholder Participation (CRESP); and the School of Public Health, RU, University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School (RWJMS). Fred Lesser is at New Jersey Ocean County Parks Service. Mike Gochfeld is at CRESP, and at RWJMS, Environmental and Community Medicine.

At the University of Wyoming, **Jim Lovvorn** and his students are completing a comprehensive study on the foraging energetics of Spectacled Eiders (SPEI; *Somateria fischeri*) during winter in the Bering Sea. This work has included:

1. Research on diet and body condition of the eiders during late winter (**Jim**

REGIONAL REPORTS – Non-Pacific United States

Lovvorn, Samantha Richman, Jackie Grebmeier, and Lee Cooper)

2. Analyses of how the dynamics of leads in moving pack ice affect the flight costs of eiders under different weather conditions (**Joseph Bump** and **Jim Lovvorn**)

3. Respirometry measurements of dive costs (**Samantha Richman** and **Jim Lovvorn**)

4. Measurements of the intake rates and digestibility for clams of different species, sizes, and depths in the benthic sediments by scoters and SPEI (**Samantha Richman** and **Jim Lovvorn**).

As a basis for estimating dive costs, a detailed study of factors affecting costs of dives to different depths was done, based on field data for Thick-billed Murres (*Uria lomvia*) instrumented with time-depth recorders and accelerometers (**Jim Lovvorn**, **Yutaka Watanuki**, **Akiko Kato**, **Yasuhiko Naito**, and **Geoff Liggins**). Results from all these studies are currently being integrated into a spatial simulation model of the energy balance of SPEI for different weather conditions and prey availability over decadal time scales. These simulations will incorporate long-term data on benthic communities collected by both American (**Jackie Grebmeier** and **Lee Cooper**) and Russian (**Boris Sirenko**) researchers.

Graduate student **Eric Anderson** at the University of Wyoming is studying the relative use of bivalve prey and herring spawn to meet the energy needs of scoters (*Melanitta* spp.) during winter and spring migration in northern Puget Sound and the Strait of Georgia. Together with a number of co-investigators including **Jim Lovvorn**, **Dan Esler** (Simon Fraser University), **Sean Boyd** (Canadian Wildlife Service), **Dave Nysewander** and **Joe Evenson** (Washington Department of Wildlife), all three species of scoters (*Melanitta fusca*, *M. perspicillata*, *M. nigra*) are being captured for samples of body mass, stable isotopes in blood, and fatty acids in adi-

pose tissue to trace the dietary sources of fat reserves accumulated during late winter and migration and carried to the breeding grounds. Seasonal patterns of behavior and prey availability are also being studied at a range of sites in northern Puget Sound. Associated studies during late migration (Juneau area) and breeding also include **John Takekawa** and **Susan Wainwright-De La Cruz** of the U.S. Geological Survey (USGS), San Francisco Bay Estuary Field Station, and **Stuart Slattery** of the Institute for Wetland and Waterfowl Research of Ducks Unlimited. Respirometry and biomechanics studies to aid in modeling habitat dependencies of scoters are being conducted by **Samantha Richman** and **Jim Lovvorn**.

Robin Overstreet (University of Southern Mississippi) and his student **Stephen Curran** are continuing studies on parasites of the American white pelican (*Pelecanus erythrorhynchos*) and cormorants (*Phalacrocorax* spp.), with an emphasis on helminths that have a detrimental effect on catfish aquaculture. In conjunction with various studies on parasites of fishes and invertebrates, Overstreet's group also is also studying parasites of several additional birds including herons (Ardeidae), gulls (*Larus* spp.), and other species that often utilize the marine environment, with an emphasis on trematodes and ascaridoid nematodes. A new study with **Drew Mitchell** (U.S. Department of Agriculture, Stuttgart, Arkansas) deals with trematode infections in the Southeast U.S., and an ongoing study is comparing southern parasites with those in select birds migrating through or residing in Summer Lake Wildlife Area (Oregon Department of Fish and Wildlife, with assistance of **Marty St. Louis** and **Mary Jo Hedrick**).

Paul Sievert (USGS, Massachusetts Cooperative Fish and Wildlife Research Unit) continues to collaborate with the U.S. Fish and Wildlife Service (USFWS), the Oregon Cooperative Fish and Wildlife Research Unit, and the Yamashina Institute for Ornithology on a satellite telemetry study of the at-sea

movements of Short-tailed Albatrosses (*Phoebastria albatrus*). He is also a member of the Short-tailed Albatross Recovery Team and is responsible for population viability analyses for the species. Recently, Paul received funding from USFWS to conduct a status assessment of Laysan Albatrosses (*P. immutabilis*) and Black-footed Albatrosses (*P. nigripes*). A postdoctoral fellow will be hired to assist with this work. The assessment will be completed by 31 December 2005.

Jeff Spendelow (USGS, Patuxent Wildlife Research Center [PWRC]) continues to coordinate his agency's long-term cooperative research project on metapopulation dynamics and ecology of the Roseate Tern (*Sterna dougallii*) in the Massachusetts-Connecticut-New York region. However, in 2004 he shifted his personal fieldwork to Buzzards Bay, Massachusetts (BBMA). The nesting population of this endangered species has declined approximately 75% since 1997 at the Falkner Island unit of the S.B. McKinney National Wildlife Refuge in Connecticut, where Spendelow had been working for more than 25 years. In BBMA, less than 5% of the Roseate Terns that colonized Penikese Island in 2003 returned to nest there; most of those that had moved to Bird Island in 2003 (as a result of hazing done at Ram Island after an April 2003 oil spill) moved back to Ram Island in 2004. Spendelow was able to trap and color-band about 350 adult Roseates. He also assisted the BBMA Tern Project staff, under the direction of **Carolyn Mostello** (Massachusetts Division of Fisheries and Wildlife) in banding more than 80% of the Roseate chicks that were later presumed to have fledged from all three BBMA sites in 2004.

Capture-recapture/resighting data from Falkner Island were analyzed using new models developed by PWRC colleagues **Jim Nichols**, **Bill Kendall**, and **Jim Hines** for a paper (Nichols et al.) that will be published in *Ecology*. This has led to the discovery that female Roseate Terns have a higher survival-

REGIONAL REPORTS – Non-Pacific United States

and-return rate than do males. Other collaborative work with **Dave Shealer** (Loras College), **Jeff Hatfield** (PWRC), and **Ian Nisbet** (I.C.T. Nisbet & Co.) has demonstrated that habitual kleptoparasitism over a 10-year period by a small number of individuals was associated with consistently superior reproductive performance, as measured both by growth and survival to fledging of their offspring, in comparison with “honest” (non-kleptoparasitic) Roseate parents. This result will be published as a paper (Shealer et al.) in *Behavioral Ecology*.

HAWAII AND PACIFIC RIM

Editor's note: The majority of this report was not received in time for publication in the fall issue of *Pacific Seabirds*. Additional topics may appear in the Spring 2005 issue.

An international group is working to eradicate rats (*Rattus* spp.) on four islands off Rakiura (Stewart) Island, New Zealand. This will benefit nesting Sooty Shearwaters (*Puffinus griseus*). **Charlene Andrade** (USFWS, Sacramento) will be the project manager on behalf of the *Command* Trustee Council, and will be working with **Hannah Nevins** and **Michelle Hester** (Oikonos Ecosystem Knowledge), **Penny Hutchins** (Ka Na Mate Nga Kiore Society, New Zealand), **Henrik Moller** and the tītī research team (University of Otago, Dunedin, New Zealand), and eradication specialist **Pete McClelland** (Department of Conservation, New Zealand) on this project.

Mark Rauzon, project manager, has successfully concluded the Department of Defense Legacy grant “Conservation of Indigenous Seabirds at Wake Atoll.” This project was a collaborative effort between The Endangered Species Recovery Council and Wildlife Management International of New Zealand. The team made a concerted effort to remove feral cats (*Felis sylvestris*) that were damag-

ing indigenous bird populations on the atoll. Although the team is reasonably confident that all cats were removed, it will take several years to confirm this. The benefits to seabirds were immediately evident. (See the Conservation Report in this issue for more details.)

In April, Rauzon also revisited Jarvis Island 20 years after cat eradication. The most significant change has been the population recovery of Blue Noddies (*Procelsterna cerula*). An estimated 650 were present, up from a couple seen in 1983. Seabird biodiversity and populations appear to have completely recovered from decades of degradation.

Rauzon has also designed and patented a bait station that is crab-resistant for use in rat control at Wake Island and Palmyra Atoll.

Scott A. Shaffer of the University of California at Santa Cruz (UCSC) is coordinating research activities on seabirds for the Tagging of Pacific Pelagics (TOPP) program. Seabirds included in this project are Black-footed Albatross (*Phoebastria nigripes*), Laysan Albatross (*P. immutabilis*), Sooty Shearwater (*Puffinus griseus*), and Pink-footed Shearwater (*P. creatopus*). Overall, the scope of the project is to determine where the birds go in relation to oceanographic features, as well as to examine multi-species interactions between all TOPP organisms (e.g. seabirds, tuna, sharks, turtles, and marine mammals). Schaffer is collaborating with **Yann Tremblay**, **Don Croll**, **Bill Henry**, and **Dan Costa**, all of UCSC; **Peter Hodum**, **Michelle Wainstein**, and **Julia Parrish**, all of the University of Washington; **Henri Weimerskirch**, Centre National de la Recherche Scientifique, France; **Dave Anderson**, Wake Forest University; **Henrik Moller**, University of Otago, New Zealand; **Paul Sagar**, National Institute for Water and Atmospheric Research, New Zealand; **Beth Flint**, U.S. Fish and Wildlife Service, Hawaii; and **Barbara Block**, Stanford University.

The project has collected multi-year tracking records for albatrosses from Tern Island, Hawaii, and Guadalupe Island, Mexico, using satellite telemetry

and archival data loggers. Several pilot efforts to track both shearwater species using archival tags have met with mixed success; the longest track was recorded for 7 months. We'll be continuing this effort again this year.

Michelle Antolos is beginning research within the TOPPS project under Dan Costa and Scott Shaffer in the Department of Ecology and Evolutionary Biology, UCSC. She will study the foraging ecology of Laysan and Black-footed Albatrosses on Tern Island.

ARCTIC AND ANTARCTIC

Ann Harding (Alaska Pacific University, Anchorage) continued her work on Dovekies (*Alle alle*; Little Auks) in summer 2004, in collaboration with **David Grémillet** of the Centre National de la Recherche Scientifique, France. She joined an expedition to east Greenland with **Carsten Eggevang** and **Flemming Merkel** (Greenland Institute of Natural Resources). The main aim of the expedition was to conduct population counts of Thick-billed Murres (*Uria lomvia*), but additional field work focused on finding a workable colony of Dovekies and collecting preliminary data on Dovekie breeding and feeding ecology in east Greenland. The team collected data on chick diet, parental energetics (doubly-labeled water), parental foraging behavior (time-depth-recorder data loggers), and chick growth.

During the austral summer, **Louise Blight** (British Columbia Ministry of Water, Land and Air Protection) took four months' leave to work on the population ecology of Adelie Penguins (*Pygoscelis adeliae*) at Ross Island, Antarctica. The principal investigator of the long-term project is **David Ainley** (H.T. Harvey and Associates); others include **Grant Ballard** (Oikonos and Point Reyes Conservation Science [PRBO]), **Katie Dugger** (Oregon State University), **Viola Toniolo** (Oikonos, PRBO), **Pete Wilson** and **Kerry Barton** (Landcare Research New Zealand), and **Rachael Orben**.

REGIONAL REPORTS – Student Reports

STUDENT REPORT

Compiled by **Shiway Wang**

This is a new section, which we hope will give more visibility to the research accomplishments of student members.

RECENT GRADUATES

The following PSG members have successfully finished their graduate degrees. Congratulations!

Eli Bridge defended his PhD dissertation at the University of Minnesota on 6 April 2004. The title of his dissertation is *Molting Strategies in Seabirds*. Bridge is currently a post-doc at the University of Memphis (until Spring 2007) under the direction of **Steve Schoech**. His current e-mail address is ebridge@memphis.edu.

Adrian Gall defended her MS thesis at Oregon State University on 22 March 2004. The title of her thesis is *Planktivorous Auklets (*Aethia pusilla* and *A. cristatella*) nesting on St. Lawrence Island, Alaska as indicators of marine conditions in the northern Bering Sea*. She is interested in seabird conservation, relationships among oceanographic factors, prey availability, and survival of seabird nests and adults. She is a Faculty Research Assistant at Oregon State University; her current e-mail address is Adrian.Gall@oregonstate.edu.

Yasuko Suzuki defended her MS thesis at the University of California, Davis, on 10 September 2004. The title of her thesis was *Factors influencing the releasability of pelicans affected by botu-*

lism at the Salton Sea. She is currently working on a Caspian Tern demography project as a research associate at **Dan Roby's** lab at Oregon State University, in order to prepare for her PhD studies in seabird conservation and ecology. Her current e-mail address is yasuko.suzuki@oregonstate.edu

Daniel Rizzolo defended his MS thesis at Oregon State University on 3 Feb 2004. The title of his thesis is *Behavioral constraints on Harlequin Duck population recovery from the Exxon Valdez oil spill in Prince William Sound, Alaska*. Dan is currently working for the U.S. Geological Survey, Alaska Science Center, Anchorage, conducting research on nesting and molting waterbirds throughout Alaska. His current e-mail address is drizzolo@usgs.gov

Sadie K. Wright defended her MSc thesis at Oregon State University on 15 September 2004. The title of her thesis is *Disturbance and Roosting Ecology of California Brown Pelicans (*Pelecanus occidentalis californicus*) on East Sand Island in the Columbia River Estuary*. Her current e-mail address is sadiwright@hotmail.com.

NEW GRADUATE STUDENTS

The following PSG members have entered a graduate program during the 2003-2004 academic year. We wish them good luck!

Rob Ronconi has started an MSc program at the University of Victoria under **Alan Burger**. The provisional title of his thesis is *Patterns and processes of*

marine habitat selection by Alcids along the southwest coast of Vancouver Island. His e-mail is rronconi@uvic.ca

Meredith Elliott has started an MA program in Marine Biology at San Francisco State University. The provisional title of her thesis is *Diet, Prey and Foraging Habits of the California Least Tern (*Sterna antillarum browni*)*. Her e-mail is melliott@prbo.org or elliottm@sfsu.edu.

Heidi J. Auman has started a PhD program at the University of Tasmania, School of Zoology, under **Catherine Meathrel** and **Alastair Richardson**. The provisional title of her thesis is *Effects of anthropogenic food sources on the body condition, blood chemistry and stable-isotopes in Tasmanian Silver Gulls (*Larus novaehollandiae*)*. (An alternative title is *Effects of "Garbivory" on seagulls!*) Her e-mail is hjauman@yahoo.com

Anne Mary Myers has started an MS program at Oregon State University under **Daniel D. Roby**. The provisional title of her thesis is *Evaluating quantitative fatty acid signature analysis (QFASA) for determination of diet composition in a piscivorous bird*. Her e-mail is myersan@onid.orst.edu

OTHER WORK

Martin Renner helped assemble the PSG student web directory and made it "spam" proof. He is still helping with edits and changes. Thank you, Martin!

TREASURER'S REPORT

The Treasurer's Report covers the Pacific Seabird Group's past fiscal year, from 1 October 2003 to 30 September 2004.

MEMBERSHIP

As of November 30, 2004 PSG has:

Life members	69
Regular	274
Student	43
Family	18
Corresponding	2
Total	397

FINANCIAL ACCOUNTS

PSG maintains a number of bank accounts. The operating funds are kept in a regular checking account.

Balance as of	September 30, 2003	\$23,752.06
Balance as of	September 30, 2004	\$29,277.96

A Morgan Stanley money market account is kept as an interest-gathering account.

Balance as of	September 30, 2003	\$21,393.08
Balance as of	September 30, 2004	\$21,524.15

Our Endowment funds (Life Memberships and other specially designated monies) are kept in a mutual fund managed by Neuberger and Berman.

Balance as of	September 30, 2003	\$90,534.88
Balance as of	September 30, 2004	\$102,923.74

OTHER ACCOUNTS

Pacific Seabirds

Vivian Mendenhall maintains an account to facilitate the printing and mailing of Pacific Seabirds

Balance as of	September 30, 2003:	\$2,197.31
Balance as of	September 30, 2004:	\$2,498.76

Canadian Memberships

Ken Morgan maintains an account in Canada so that Canadian members can pay dues in Canadian dollars.

Balance as of	September 30, 2003:	\$48.52
Balance as of	September 30, 2004:	\$734.84

United Kingdom Memberships

Mark Tasker maintains an account in the UK so that UK members can pay their dues in pounds sterling.

Balance as of	September 30, 2003:	\$1,734.75
Balance as of	September 30, 2004:	\$770.32

Total Assets as of September 30, 2003 : \$139,660.60

Total Assets as of September 30, 2004: \$157,729.77

TREASURER'S REPORT

PROFIT AND LOSS, CASH BASIS

Oct 2003-Sep 2004

Ordinary income/expense	
Income	
Books/publication	\$483.00
La Paz banquet tickets	\$2,500.00
La Paz registration	\$5,234.80
Membership dues	\$9,709.29
Total income	\$17,927.09
Expenses	
Pacific Seabirds	\$2,688.55
Dues and subscriptions	\$438.20
Liability insurance	\$3,239.56
Marine Ornithology	\$5,365.00
Office supplies	\$483.25
Postage and delivery	\$1,129.42
Accounting	\$757.50
State taxes	\$20.00
Web site hosting (PSG)	\$107.46
Total expenses	\$14,228.94
Net ordinary income	\$3,698.15
Other income/expenses	
Other income	
Dividends	\$281.10
Endowment fund holding	\$2,480.00
Total other income	\$2,761.10

PUBLISHED PROCEEDINGS OF SYMPOSIA OF THE PACIFIC SEABIRD GROUP

The Pacific Seabird Group holds occasional symposia at its annual meetings. Published symposia are listed below. They are available for purchase (unless out of print). To order, see the membership application/publication order form.

SHOREBIRDS IN MARINE ENVIRONMENTS. Frank A. Pitelka (Editor). Proceedings of an International Symposium of the Pacific Seabird Group. Asilomar, California, January 1977. Published June 1979 in Studies in Avian Biology, Number 2. **Out of print.**

TROPICAL SEABIRD BIOLOGY. Ralph W. Schreiber (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Honolulu, Hawaii, December 1982. Published February 1984 in Studies in Avian Biology, Number 8. **Out of print.**

MARINE BIRDS: THEIR FEEDING ECOLOGY AND COMMERCIAL FISHERIES RELATIONSHIPS. David N. Nettleship, Gerald A. Sanger, and Paul F. Springer (Editors). Proceedings of an International Symposium of the Pacific Seabird Group, Seattle, Washington, January 1982. Published 1984 as Canadian Wildlife Service, Special Publication. **Out of print.**

THE USE OF NATURAL VS. MAN-MODIFIED WETLANDS BY SHOREBIRDS AND WATERBIRDS. R. Michael Erwin, Malcolm C. Coulter, and Howard L. Cogswell (Editors). Proceedings of an International Symposium at the first joint meeting of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Colonial Waterbirds 9(2), 1986. \$12.00 **from Ornithological Societies of North America**, PO Box 1897, Lawrence, Kansas 66044; phone (800) 627-0629.

ECOLOGY AND BEHAVIOR OF GULLS. Judith L. Hand, William E. Southern, and Kees Vermeer (Editors). Proceedings of an International Symposium of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Published June 1987 in Studies in Avian Biology, Number 10. \$18.50. **Available from publisher.**

AUKS AT SEA. Spencer G. Sealy (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published December 1990 in Studies in Avian Biology, Number 14. \$16.00. **Available from publisher.**

STATUS AND CONSERVATION OF THE MARBLED MURRELET IN NORTH AMERICA. Harry C. Carter, and Michael L. Morrison (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published October 1992 in Proceedings of the Western Foundation of Vertebrate Zoology, Volume 5, Number 1. \$20.00. **Order from PSG treasurer.**

THE STATUS, ECOLOGY, AND CONSERVATION OF MARINE BIRDS OF THE NORTH PACIFIC. Kees Vermeer, Kenneth T. Briggs, Ken H. Morgan, and Douglas Siegel-Causey (editors). Proceedings of a Symposium of the Pacific Seabird Group, Canadian Wildlife Service, and the British Columbia Ministry of Environment, Lands and Parks, Victoria, British Columbia, February 1990. Published 1993 as a Canadian Wildlife Service Special Publication, Catalog Number CW66-124-1993E. **Free of charge from:** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A OH3, Canada.

BIOLOGY OF MARBLED MURRELETS—INLAND AND AT SEA. S. Kim Nelson and Spencer G. Sealy (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Seattle, Washington, February 1993. Published 1995 in Northwestern Naturalist, Volume 76, Number 1. \$12.00. **Order from PSG treasurer.**

BEHAVIOUR AND ECOLOGY OF THE SEA DUCKS. Ian Goudie, Margaret R. Peterseen and Gregory J. Robertson (editors). Proceedings of the Pacific Seabird Group Symposium, Victoria, British Columbia, 8-12 November 1995. A special publication compiled by the Canadian Wildlife Service for the Pacific Seabird Group. Published 1999 as Canadian Wildlife Service Occasional Paper number 100, catalog number CW69-1/100E. **Free of charge from:** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A OH3, Canada.

SEABIRD BYCATCH: TRENDS, ROADBLOCKS AND SOLUTIONS. Edward F. Melvin and Julia K. Parrish (editors). Proceedings of an International Symposium of the Pacific Seabird Group, Blaine, Washington, 26-27 February 1999. Published 2001 by University of Alaska Sea Grant, Fairbanks, Alaska. Publication no. AK-SG-01-01. \$40.00. **Available from publisher.**

BIOLOGY, STATUS, AND CONSERVATION OF JAPANESE SEABIRDS. Nariko Oka (editor). Proceedings of an International Symposium of the Japanese Seabird Group and Pacific Seabird Group, Lihue, Hawaii, February 2001. Journal of the Yamashina Institute of Ornithology 33(2); Symposium (5 papers), pp 57-147, other papers pp. 148-213. In English with Japanese abstracts. \$75.00. **Order from PSG treasurer.**

Information on presenting symposia: Pacific Seabird Group Symposia are initiated by any PSG member with interest in a particular topic. The goal is to present a collection of papers that explore and review this topic, usually at an annual meeting of the Pacific Seabird Group. In some cases the papers are then edited and published as a PSG Symposium. Anyone interested in organizing a symposium must first contact

PACIFIC SEABIRD GROUP COMMITTEE COORDINATORS

Committees do much of PSG's business, as well as the conservation work for which PSG is respected. The committees welcome (and need) participants; contact the coordinators for information.

CONSERVATION COMMITTEE

Craig S. Harrison, 4953 Sonoma Mountain Road, Santa Rosa, CA 95404, USA. Telephone: (202) 778-2240, e-mail: charrison@erols.com

ELECTION COMMITTEE

Pat Baird, Department of Biological Sciences, California State University, Long Beach, CA 90840 USA. Telephone: (562) 985-1780, fax: (562) 985-8878, e-mail: patbaird@csulb.edu

JAPAN SEABIRD CONSERVATION COMMITTEE

Koji Ono, office: Hokkaido Seabird Center, Kita 6-1, Haboro, Tomamae 078-4116 Japan. Telephone: 011-81-1646-9-2080, fax: 011-81-1646-9-2090; home: 2-506, Sakaemachi 93-12 Haboro, Tomamae 078-4123 Japan. Telephone and fax: 011-81-1646-2-1324, e-mail: kojiono@gol.com; and **John Fries**, Laboratory for Wildlife Biology, University of Tokyo, 1-1-1 Yayoi Bunkyo-ku, 113 Tokyo, Japan. Telephone/fax: 011-81-356-89-7254, e-mail: fries@uf.a.u-tokyo.ac.jp

MARBLED MURRELET TECHNICAL COMMITTEE

Anne Harfenist, P.O. Box 2498, Smithers, B.C. V0J 2N0 Canada. Telephone: (250) 847-1730, e-mail: harfenis@bulkley.net

PUBLICATIONS COMMITTEE

Patrick Jodice, 2002 Forestry Sciences Laborataory, 3200 SW Jefferson Way, Oregon State University, Corvallis, OR 97331. Telephone: (541) 750-7393, e-mail: jodicep@ucs.orst.edu

SEABIRD MONITORING COMMITTEE

Scott Hatch, Biological Resources Division, U.S. Geological Survey, Alaska Biological Science Center, 1011 E. Tudor Rd., Anchorage, AK 99503 USA. Telephone: (907) 786-3529, fax: (907) 786-3636, e-mail: scott_hatch@usgs.gov

XANTUS'S MURRELET TECHNICAL COMMITTEE

Gerald L. McChesney, U.S. Geological Survey, 6924 Tremont Road, Dixon, CA 95620, USA. E-mail: gerry_mcchesney@usgs.gov.

PSG DELEGATES TO THE AMERICAN BIRD CONSERVANCY

Craig S. Harrison, 4953 Sonoma Mountain Road, Santa Rosa, CA 95404, USA. Telephone: (202) 778-2240, e-mail: charrison@erols.com; and **Malcolm C. Coulter**, P.O. Box 48, Chocorua, NH 03817 USA. Telephone: (603) 323-9342, e-mail: coultermc@aol.com

AWARDS COMMITTEE

The Awards Committee consists of the Past Chair, Chair, and Chair-elect. The Committee Coordinator for 2003 is **Lisa Ballance**, Southwest Fisheries Science Center, National Marine Fisheries Service, 8604 La Jolla Shores Drive, La Jolla, CA 94037, USA. Telephone: (858) 546-7173; fax: (858) 546-7003; e-mail: Lisa.Ballance@NOAA.gov

PSG LIFE MEMBERS 2004

David G. Ainley	Judith Latta Hand	Harou Ogi
Sarah G. Allen	Craig S. Harrison	Koji Ono
Daniel W. Anderson	Scott A. Hatch	Julia K. Parrish
Pat H. Baird	Monica Herzig Zürcher	C. John Ralph
Lisa Ballance	Nancy Hillstrand	William P. Ritchie
Kenneth T. Briggs	Joel D. Hubbard	Chad Roberts
Joanna Burger	David B. Irons	Daniel R. Roby
Ellen W. Chu	Sarah Keller	Gerald A. Sanger
Roger B. Clapp	James G. King	Palmer C. Sekora
Cheryl Conel	Kathy Kuletz	Nanette Seto
Malcolm C. Coulter	James Kushlan	Kouzi Shiomi
Kathy Cousins	Lora Leschner	Kitty Simonds
Theodore L. Cross	David B. Lewis	Douglas Siegel-Causey
Robert H. Day	Peter Major	William E. Southern
Tony DeGange	Eugene Y. Makishima	Arthur L. Sowls
Jan Dierks	Vivian Mendenhall	Jeffrey A. Spendelow
George J. Divoky	Gayle Merlen	Takaki Terasawa
Stewart Fefer	Godfrey Merlen	W. Breck Tyler
Lloyd C. Fitzpatrick	Pat Mock	Enriquetta Velarde Gonzalez
Elizabeth Flint	Ken Morgan	Kees Vermeer
Douglas J. Forsell	Edward C. Murphy	John S. Warriner
Michael Fry	Maura Naughton	Yutaka Watanuki
Lisa Hagblom	S. Kim Nelson	Jeff Williams
	David R. Nysewander	

RECIPIENTS OF PSG'S LIFETIME ACHIEVEMENT AWARD

Philip and Myrtle Ashmole	Charles Guiguet [#]	James G. King
James C. Bartonek	Thomas R. Howell	Robert E. Ricklefs
W.R.P. Bourne	Karl W. Kenyon	Miklos D.F. Udvardy [#]
Richard G.B. Brown		John Warham

RECIPIENTS OF PSG'S SPECIAL ACHIEVEMENT AWARD

George J. Divoky	Arthur L. Sowls	Malcolm Coulter
Craig S. Harrison	Steven M. Speich [#]	Hiroshi Hasegawa

[#]Deceased

Pacific Seabird Group

Membership Application/Publication Order Form

(Please copy)

Membership (includes subscription to Pacific Seabirds)

Individual and Family \$25.00	\$ _____
Student (undergraduate and graduate) \$15.00	\$ _____
Life Membership ¹ (optional payment plan, five \$120 installments) \$750.00	\$ _____
Sponsored Membership \$25.00	\$ _____

Contributions²

To the Endowment Fund ²	\$ _____
Other (please specify)	\$ _____

Back issues of Pacific Seabirds

Vols. 1-8 (1974-1981) @ \$2.50/issue (two issues/year)	
Specify Volume(s) and Number(s) _____ x \$2.50	\$ _____
Vols. 9-present @ \$5.00/issue (two issues/year)	
Specify Volume(s) and Number(s) _____ x \$5.00	\$ _____

PSG SYMPOSIA

Use of Natural vs. Man-modified Wetlands by Shorebirds and Waterbirds: <i>Order from publisher</i> ³	
Ecology and Behavior of Gulls _____ x \$18.50	\$ _____
Auks at Sea _____ x \$16.00	\$ _____
Status, Ecology, and Conservation of Marine Birds of the North Pacific: <i>Free of charge</i> ³	
Status and Conservation of the Marbled Murrelet in North America _____ x \$20.00	\$ _____
Biology of Marbled Murrelets: Inland and at Sea _____ x \$12.00	\$ _____
Behaviour and Ecology of Sea Ducks: <i>Free of charge</i> ³	
Seabird Bycatch: Trends, Roadblocks, and Solutions: <i>Order from publisher</i> ³	
Biology, Status, and Conservation of Japanese Seabirds _____ x \$75.00	\$ _____

PSG Technical Publications

Number 1, <i>Exxon Valdez Oil Spill Seabird Restoration Workshop</i> _____ x \$18.00	\$ _____
--	----------

Books

The Ancient Murrelet _____ x30.00	\$ _____
-----------------------------------	----------

TOTAL ENCLOSED (U.S. Dollars)

Prices include postage (surface rate) and handling.

SEND CHECK OR MONEY ORDER (make checks payable to the **Pacific Seabird Group**) TO:

In US dollars (most countries): Ron LeValley, PSG Treasurer, Mad River Biologists, 1497 Central Ave., McKinleyville, CA 95519, USA

In Canadian dollars: Ken Morgan, Inst. of Ocean Sciences, Box 6000, 9860 W. Saanich Rd., Sidney, BC, Canada, V8L 4B2

In pounds sterling: Mark Tasker, JNCC, Dunnet House, 7 Thistle Place, Aberdeen AB10 1UZ, Scotland, UK

¹ Contributions may be tax-deductible; see inside front cover for more information.

² Proceeds from Life Memberships and contributions go to the Endowment Fund, which supports the publications of the Pacific Seabird Group.

³ To order, see information in "Published Proceedings of Symposia of the Pacific Seabird Group," above.

Member/Sponsor or Order

Name _____

Address _____

Telephone _____

Fax _____

E-mail _____

Deliver/Ship to (if different)

Name _____

Address _____

Telephone _____

Fax _____

E-mail _____